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ORIGINAL ARTICLES.

DIGESTIVE FERMENTS WITH ESPECIAL REFERENCE TO THEIR USE IN SURGERY.*

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Ferments may be defined as substances which cause chemical change in other bodies without undergoing obvious change themselves. They are apparent exceptions to the general law of natural philosophy that every action is accompanied by a corresponding and equal reaction, and their effect depends only slightly on quantity. Ferments are of two classes, (1) organic products without life and (2) living organisms. Taking the definition in the most general way, one is tempted to follow Brunton and make a third class to include such purely mineral substances as spongy platinum whose influence in chemical processes is as mysterious as it is pronounced.

You are familiar with the organic but unorganized ferments of the human body: ptyalin of the saliva, pepsin of the gastric juice, amyllopsin, trypsin and perhaps steapsin of the pancreatic secretion, invertin of the intestinal secretion, rennint of both gastric and

pancreatic juices, and the somewhat hypothetical fibrin ferment of the blood. Similar ferments are found in most animal bodies, including even some animalcula. Of late years, a number of vegetable digestive ferments have been put on the market, including the well-known malt preparations of diastase, taka-diastase, various proprietary extracts from the paw-paw, and bromalin from the pineapple. Energetic ferments are also found in most carnivorous plants, including especially the sundew and Venus's fly-trap.

In the face of the enormous popularity and consequent commercial success of the various ferments, and of their well-demonstrated action in digesting different kinds of food, it may seem presumptuous to say that it is only in the rarest medical cases that they are of value. Allow me to use an illustration that will be peculiarly appropriate to a meeting of the surgical section of the Academy. Let us suppose that a hundred miscellaneous patients consult a doctor, all complaining of lameness. The degree

*Read at the meeting of the Surgical Section of the Buffalo Academy of Medicine, September 1, 1896.
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or lameness may vary widely, some patients will use crutches, others not, some will complain of pain, others of stiffness of muscles and, in general, the particular symptoms will cover a wide range. Let us suppose that, ignoring all symptoms but the cardinal one of lameness and failing even to look at the lower extremities of his patients, the doctor writes down the diagnosis in each case as "lameness" and prescribes for every patient an artificial leg. You can easily judge in what proportion of average cases, the prescription would be appropriate and in how many instances the patients would lack the natural member which the doctor has sought to replace with an artificial leg. Yet, with one exception, this is an accurate surgical analogy to the average medical case which is diagnosed as "dyspepsia" and treated with digestive ferments. True, the patient cannot look into his stomach or intestine as he could at his feet and say, "I already have what you seek to supply," nor is the folly of adding pepsin to pepsin or diastase to ptyalin quite so obvious as the proposal to attach an artificial limb to a patient who still has his natural pair of supports.

The point in which the comparison is not quite accurate is this: Although pepsin and diastase are substances which act qualitatively rather than quantitatively, it is certainly true that patients suffering with dyspepsia not due to failure of these ferments are temporarily relieved by their administration as drugs and that gastric juice containing plenty of pepsin but lacking in acidity will have its digestive activity increased by the addition of more pepsin. However, neither in the experiment in the test-tube nor in the practical therapeutic effect, is this illogical treatment so effective as the rational correction of the digestive error. A comparison may be made to the relief which some patients receive from the use of lenses not at all adapted to the refractive error of their eyes. There may be this basis for the favor in which pepsin is held. The same man who is fond of prescribing pepsin usually likes to administer comparatively large doses of soda or other alkali for the sour stomach which follows a failure of hydrochloric acidity. The alkali destroys pepsin in its preliminary

stage of pepsinogen, though not in the final stage. Thus, the joint use of soda and pepsin first destroys whatever natural digestive power may be present and then supplies the deficiency which it has created.

There are certain cases in which it is expedient—and here, as elsewhere, *expedient* may not be synonymous with *wise* or *proper*—to lend the aid of digestive ferments temporarily. The opportunity for a careful diagnosis may have been refused, or the stomach, though lacking in acidity, may be irritated by the attempt to supply acid artificially. In such cases, it seems best to use ferments foreign to the natural product of the stomach, on the general principle that it is unwise to supplant or render unnecessary the performance of a natural physiological function. Here is a useful field for the various preparations of paw-paw. Papoid I have used considerably and with good results, though it must be borne in mind that it will not digest everything—as one may infer from some of the advertisements—nor prevent bacterial and yeast fermentation. Papain is also excellent, though both are held at a rather high price as compared with pepsin. With bromalin, I have had no experience, preferring to use the fresh juice of the pineapple, which can be obtained in Buffalo at most seasons and which is palatable to almost all patients. But it must be remembered that, after a hearty mixed meal, comparatively little digestion takes place in the stomach, and that so long as stomach contents can be removed, they will appear undigested and will disappoint patient and physician, till careful chemical tests are applied to the filtrate.

We hear a great deal at present about starch indigestion, and the indication for some form of diastase. It must be granted that one of the most common and most troublesome symptoms of gastric indigestion is the fermentation of starches, but it is a mistake to regard this as anything more than a symptom. If proteid digestion occurs normally, and yeasts and bacteria are held in check by the gastric juice, we need not concern ourselves about the starches. They may or may not digest in the stomach. Raw starch cannot and

cooked starch will not, except to a limited amount. Starch digestion in the stomach depends directly on the degree of insalivation and inversely on the degree of acidity — factors which vary widely between normal limits and which are not constant during the digestion of a given meal, nor at the same time after eating in the same individual. Whatever starch passes through the stomach undigested will be cared for by the pancreatic juice, except in rare instances. On the other hand, a stomach which is foul and in which not only acid fermentation but actual putrefaction is taking place, will give the symptoms of starch fermentation, and, if the patient vomits, undigested starch will certainly be present. But no amount of diastatic ferment will effect a radical relief.

The indication is plainly to place the stomach in proper condition to digest proteids, and, above all, to render it clean. The starches will then take care of themselves. Speaking of the failure of starches to digest, Ewald says: "Under such circumstances, one might suspect a deficiency of ptyalin in the saliva. Yet this does not appear to be the case. For a long time, I have tested the fermentative power of saliva in patients with dental caries, inflammatory lesions of the mouth, angina, diphtheria, carcinoma of the tongue, and similar conditions, but never have I found a saliva which could not convert starch into sugar." Excepting angina, diphtheria and carcinoma of the tongue, my own experience may be stated in ditto marks to Ewald's assertion, though his experiments are certainly of earlier date and undoubtedly of much greater number than mine. In cases of gastric ulcer, cancer, and severe non-malignant dilatation, I have examined the saliva, almost hoping to find a deficiency of ptyalin, but such has never been found by ordinary simple tests, though diastimetry might have demonstrated a relative weakness.

As regards the use of pancreatic ferments, either isolated or combined, it is difficult to express an opinion based on actual observation. We have no means of examining into intestinal digestion, as in the case of the stomach; disease of the pancreas, whether functional or organic, is rare and extremely difficult

to diagnose. We know that the normal gastric juice will destroy pancreatin as ordinarily administered, though the theoretical efficacy of a coating of salol or keratin has not been absolutely improved. Few or no cases of obvious intestinal indigestion occur without gastric indigestion and the correction of the latter usually results in the proper performance of the intestinal function. Under these circumstances, we may conclude (1) that there is no *a priori* reason for supposing pancreatin to be of any service, and (2) that its uselessness is not so thoroughly demonstrated as in the case of pepsin and diastase.

In addition to the ferments commonly recognized, we owe to surgeons long and elaborate series of observations which show that either pepsin, or some other digestive ferment is universally distributed through the active tissues of the body. Hematemata, often of considerable size, are resolved; the products of extra-uterine pregnancy slowly disappear; almost all kinds of aseptic sutures and ligatures, including the toughest animal structures known, are gradually absorbed by the tissues; the peritoneum, after proper stimulation by section, irrigation or the introduction of sterilized air, has absorbed not only water, but the products of tubercular inflammation, apparently digesting the bacilli themselves; callus about broken bones is removed in the same mysterious but effective manner; particles of flesh and small fetal animals, introduced within the peritoneum, have been entirely absorbed; after intestinal surgery, particularly after experimental operations on healthy animals, the sutures and infolded ends of intestine have been so thoroughly removed that it has been impossible, on subsequent section, to locate the site of the former operation. All this means digestion and digestion of an energetic character, in spite of its comparatively slow course, since the substances cited as absorbed are of an exceedingly resistant nature and would pass through the intestine, after having remained in contact with the various digestive juices for two days, almost unchanged. Moreover, sutures and ligatures rendered as impervious to secretions as possible, by the use of chromic oxid, mineral dyes or other preserva-

tives, also yield in time to the fluids of exudation in all active tissues of the body. If the absorption so carefully observed by surgeons were merely a physical process of solution, we should have bullets, needles and silver wire absorbed rather than catgut and tendon. Neither is the problem a simple one in chemistry, or we should hear more encouraging reports from the effects of electrolysis, instead of the almost universal expression of dissatisfaction.

About a year and a half ago, I deliberately retained a case of minor surgery in order to put into execution an idea already entertained for some time, and which I have since learned has been suggested by others. The case was a septic wound of the hand, which had been dressed at one of the dispensaries or emergency hospitals, two or three days before. On removing the dressings, which seemed to have been applied with due care, there was exposed a suppurating and granulating wound of the palm, with a good-sized tendon end projecting. It was plain that the tendon could not be sutured into its natural connection, nor could the most elaborate trimming remove all the structures destined to be destroyed by suppuration. I, therefore, with some hesitation, dressed the wound with pepsin in powder and covered it with plain absorbent cotton, wet with a 1-500 solution of hydrochloric acid. The next day, the wound appeared much cleaner, there was comparatively little suppuration and the tendon end and other scraps of tissue in the bottom of the wound had somewhat diminished in size. The wound was then dressed with iodoform and antiseptic gauze in order to afford a comparison between the two modes of treatment. The result of this dressing was satisfactory, so far as the control of suppuration was concerned, but, at the end of two days, the wound seemed no nearer healing than at the beginning. The digestive dressing was then re-applied and maintained for two or three days, being renewed each afternoon, except that, as a matter of caution, the antiseptic dressing was again applied for a day during this period. The wound having now been cleared of tissues requiring removal and having contracted considerably, simple antiseptic dressings were re-applied and healing took place kindly.

We have already learned that bacteria in general are not always the emissaries of Satan which the early advocates of antiseptics considered them. In the development of vegetation, in reducing dead organic bodies of either kingdom to their constituents, in various fermentations, they perform useful parts. Even in suppuration, I believe we are justified in returning somewhat to the old conception of beneficence embodied in the term *pus laudabile*. Contrast the insignificant trouble occasioned by a boil with the depressing or even fatal effect of a carbuncle. Yet it is difficult to frame a definition that will distinguish clearly between these two lesions, and the essential line of clinical differentiation is according to the presence or absence of a "core." In short, a boil is a trifling matter, because the focus of infection and inflammation is speedily softened by the action of bacteria, while a carbuncle pursues a slow course and allows a condition of sapremia to develop because the infected fibrous tissue is not reduced to a pulp by the digestive action of germs. I say digestive action since many, if not most bacteria of suppuration, produce albumose and perhaps true peptone from the albuminous constituents of the tissues which they attack. So-called peptonuria—or really albumosuria—is now a well-recognized sign of concealed suppuration. In passing, allow me to call attention to the fact that germs of putrefaction do not usually cause such digestion and that there is a partial separation of pyogenic and saprophytic bacteria. It occurred to me at one time that saprophytes probably shared the digestive action of pus-producers and that albuminous urine, after decomposition, would give the biuret reaction which is quite delicate and which might be used to verify or disprove the existence of a doubtful trace of albumin. Unfortunately, no such reaction occurred, my premise having been incorrect.

The digestive action of pyogenic bacteria, restrained within proper limits, may well be considered conservative. It is desirable that a clean cut, whether inflicted accidentally or by the surgeon, should unite edge to edge, with the least possible destruction of tissue. Not so with a wound in which the tissues are lacerated or cut off from their blood-

supply or in which infection has already destroyed the vitality of certain structures. Here there is a positive indication for the removal of tissues which cannot resume a normal growth. Some years ago, I assisted, as house-surgeon, at a case of abscess in the head of the tibia—whether tubercular, syphilitic or otherwise was not determined. The progress under antiseptic dressings was tedious and the visiting surgeon, to my horror, directed that the antiseptic dressings be removed and the cavity packed with plain, unsterilized lint. Profuse suppuration naturally ensued, vigorous granulations sprang up and the case progressed rapidly and favorably. It may be objected that the result was due entirely to the removal of the depression, which sometimes follows the use of iodoform, etc., and that the effect was vital rather than chemical. But I believe that part, at least, of the effect noted in such cases and in the spontaneous healing of abscesses and other infected areas, is the result of a destruction of doomed tissues by bacteria, thus clearing away the debris above a firm foundation of healthy cells.

But there are obvious disadvantages to such a method. The surgeon who introduces or allows to develop in a wound, germs of suppuration assumes a heavy moral responsibility which might prove to be a professional and financial one if the bacteria escaped from control. Yet the necessity of getting rid of necrotic tissue is equally plain. In most cases, a suppurating wound containing necrotic masses will continue to suppurate in spite of our efforts at antiseptics, the needful digestive action of bacteria persisting. In other instances, suppuration being nearly or quite controlled, such tissues can be removed only by the slower process of digestion and absorption already referred to, as affecting sutures and ligatures. The method to which I have called your attention this evening is comparatively rapid, even more so than the spontaneous digestion by bacteria which occurred under the old regime, while it is reasonably free from danger in the direction of sepsis. The methods of manufacturing pepsin make it an object of suspicion on account of possible infection, but the cases in which its use would be indicated are

such that the addition of a few more bacteria, not at all apt to be of any special virulence, is like "carrying coals to Newcastle." The addition of hydrochloric acid also controls any tendency to the development of bacteria though it may well be doubted that the acid and pepsin mixture remains of a sufficient strength to be actually germicidal.

DISCUSSION.

DR. HARTWIG cited the use of mixtures of pepsin and hydrochloric acid, as well as of hydrochloric acid alone in order to digest necrosed bone and called attention to the fact that Morris had used similar digestants in the treatment of certain phases of appendix inflammation. He thought that there was much promise as to the usefulness of digestants in surgical practice.

DR. BENEDICT, in reply, said that he had formerly used injections of hydrochloric acid for necrosis of bones but that he had omitted reference to this method as it was a matter of chemical solution and not of digestion in the ordinary organic sense. He was not aware of the use of digestants to which Dr. Hartwig had alluded but it was not strange that he had not happened on such reports, as his work was not of a surgical character. The paper had been written on very short notice and there had been no time for searching the literature of the subject, further than to refer to the indexes of the last four issues of *Sajous' Annual* in which he had not been able to find any allusion to the employment of digestants in surgery. As he had stated in the paper, he had come to the meeting ignorant as to what degree of originality could be claimed or to what extent he had been anticipated by others.

Attorney (examining witness)—You say you saw the shots fired.

Witness—Yes, sir.

"How near were you to the scene of the affray?"

"When the first shot was fired I was about ten feet from the shooter."

"Ten feet. Well, now, tell the court where you were when the second shot was fired."

"I didn't measure the distance."

"Speaking approximately, how far should you say?"

"Well, it approximated to half a mile."—*Texas Sifter*.

Mother (impatiently)—I don't know whatever will become of that child. Nothing pleases him. Father (serenely)—Well, we'll make an art critic of him.
—*Bengal Punch*.

RECONSTRUCTIVE SURGERY OF THE TUBES AND OVARIES.*

ROBERT T. MORRIS, M.D., New York.

In the early days of abdominal surgery, it was necessary for operators to do some destructive work in order to obtain the object lessons which enabled them to do constructive surgery of the ovaries and tubes later. Seeking ever to render service to the patient, the surgeon hails with delight each step in progress which allows him to exchange the coffer-dam of conservatism for the solid masonry of knowledge, and to-day he can spare many a tube and many an ovary that formerly would have been extirpated. I shall speak very briefly this afternoon of degenerating uterine adnexa which belong to the degenerating individual, and of disabled uterine adnexa which have been damaged by acute inflammatory processes.

When the gardener, by artificial selection, develops the rose for beauty, he gives to it every advantage that the plant would desire, and after a few generations the stamens have become transformed into glorious petals; or, in other words, the ovary has degenerated and the beautiful flower has lost its ability to propagate its kind. So in the human species—the girl, surrounded by opportunities of present-day civilization, has a tendency to become beautiful and intellectual at the cost of her generative function. The whole reproductive apparatus degenerates.

Acute inflammatory processes cause another sort of injury. We find oviducts with fimbriae so agglutinated that ovules cannot enter the tube. We find ovaries so buried in adhesions that ovules cannot escape from the net, and it is in this latter group of cases that the surgeon finds his greatest opportunity to do reconstructive work. Some years ago, when Dr. Emmet was vigorously taking the stand adopted by most general surgeons against unwarranted ovarian surgery, he made to my mind the strongest appeal when he compared the inflamed

ovary to an inflamed testicle, and stated that if such a testicle were removed, we should find under the microscope a horrible pathologic condition, and yet such a testicle might become perfectly normal and useful if it were not removed. I have no patience with the surgery which removes ovaries because they are too hard or too soft, or too big or too little, or because they are disabled by adhesions. My office boy can remove ovaries and tubes, but it requires the most profound surgical erudition to know what ovaries and tubes we can save, and it is that sort of skill in which the real benefactor of mankind delights.

In the brief time allotted me this afternoon, I cannot make an elaborate classification of cases, but will simply say that, in the proper sort of cases, the following surgical resources promise much for progressive surgery:

1. When an ovary and tube are shelled out of adhesions, agglutinated fimbriae are carefully separated and a probe is passed through the lumen of the occluded oviduct. We know that adhesions are likely to re-form immediately if such adnexa are dropped back into the pelvis without further treatment; so we proceed to guard against that result by pressing permanganate of potassium crystals against oozing points, and having dried the adnexa with gauze, aristol is rubbed into the ragged tissues from which adhesions were separated. Aristol is soon encapsulated in a lymph coagulum, which makes a mechanical obstacle to re-formation of adhesions until the coagulum has been gradually replaced by nice, smooth connective tissue and endothelium. The practical utility of this resource I have demonstrated experimentally upon rabbits and upon patients whose abdominal cavities had to be opened later for some reason.

2. When the fimbriated end of an oviduct has been entirely obliterated, leaving it club-shaped and occluded, a resource which has been employed by

*Delivered at the fiftieth annual meeting of the Alumni of the University of Buffalo, Medical Department, May, 1896.

operators gives encouragement, and I have heard of pregnancies following its application, but have not as yet obtained one in my own practice. The resource consists in opening and stretching the oviduct widely, splitting it on one side and suturing it to the ovary in such a way that mucosa of oviduct is spread over a part of the peritoneal surface of the ovary. I can foresee the danger of extra-uterine pregnancy in some of these cases, but so long as we are on guard, the danger to the patient's life is trifling.

3. When an ovary and tube have been so much damaged by acute inflammation and adhesion that we cannot hope to restore them to a fairly normal condition, we can remove a piece of ovary about as large as a lentil, place it temporarily in warm physiological saline solution, and then, having split the oviduct or the fundus of the uterus, the graft of ovary is sutured in place in such a way that peritoneal surface of ovary protrudes into the lumen of the oviduct or uterus. I have obtained one pregnancy by the application of this resource. Unfortunately, the patient aborted at the third month because remaining pelvic adhesions prevented the uterus from enlarging freely. But, nevertheless, we have a demonstration of the fact that a segment of ovary, entirely separated and then grafted upon a new seat, can form fruitful ova. In this work I was guided by our knowledge of the fact that a small piece of transplanted thyroid gland would continue to perform its functions.

4. When the ovary has been entirely destroyed, or removed previously by operation, or when the ovary has degenerated or has failed to develop, we can graft a segment of ovary from another patient into the uterus of the patient who wishes to receive an ovarian graft. The segment of ovary removed from one patient is placed in warm physiological solution, and the uterus of the second patient is then immediately prepared to receive it. I have not as yet done this for a married woman, but there is no reason why the graft should not do what it did in the one successful case when the patient was grafted with a piece of her own ovary. In one patient, who had never menstruated up to her twentieth year because of rudimen-

tary adnexa, menstruation was established after I had placed in the fundus of her uterus a graft from another patient.

* The necessity of separate quarters for tuberculous patients, or at least the necessity of separating them from the rest in special wards appropriated for their exclusive use in the present hospitals, is dwelt upon in the report of the committee appointed by the municipal authorities of Paris. They also recommend the decentralization of tuberculous patients by removing them to special sanatoria in healthy localities. Letulle also suggests the establishment of curable tuberculosis colonies in Algiers and Corsica. They also demand that the patients and attendants should be carefully educated to understand the necessity of prophylactic measures, with penalties enforced for neglecting them. The attendants must also be selected with care, and all rejected that show any tendency to morbid conditions of the respiratory organs. They found that 1,296 of the total of 4,470 attendants connected with the hospitals of Paris were already diseased, 661 with bronchial affections and 526 with pulmonary tuberculosis. There have been 599 deaths among them during the past ten years, 217 due to tuberculosis and 154 to other diseases of the respiratory organs.—*Medical Record*.

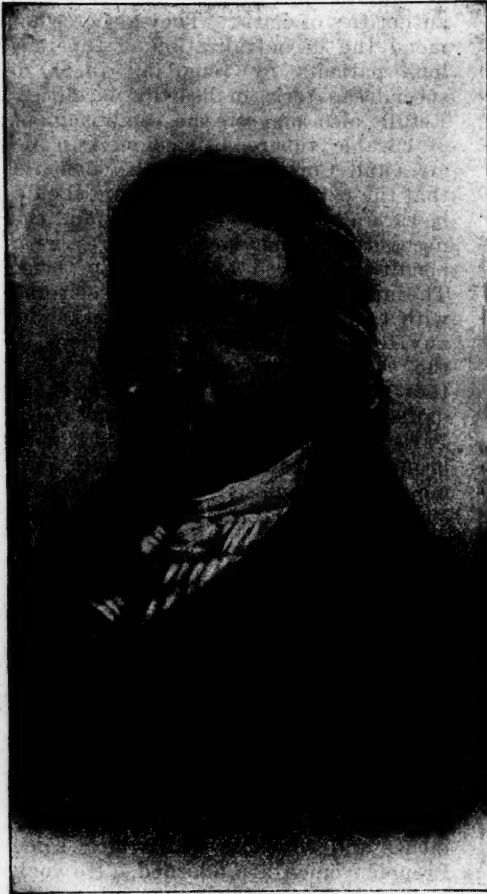
All that appears in print is not necessarily true, as a recent case shows. A man in Paris heard of a case in which the hair of the head fell out from a patch exposed to the x-rays, and thought he had discovered a way to make his fortune. He accordingly advertised that he would guarantee to remove the mustaches and whiskers with which some French women are adorned. He took his fees and exposed the patients to the apparatus, but, as the hair showed no sign of disappearing, he was straightway arrested for fraud.

"I'll bet that man down there in the corner near the door eats his pie with a knife." "Why?" "You see he is using a finger to cut the pages of his magazine."—*Cleveland Leader*.

COMMUNICATIONS.

THE MARIETTA VACCINE FARMS.

WILLIAM H. BURR, M.D., PHILADELPHIA.



WILLIAM JENNER.

Although the profession in general is aware of the existence of the large farms at Marietta, Lancaster County, Pa., for the production of vaccine virus, few know of their extent or of the many precautions used to insure the obtaining of virus physiologically pure. During the annual meeting of the State Medical

Society last May, Dr. H. M. Alexander, the proprietor of the farm, gave a celebration of the centennial of Dr. Jenner's discovery of vaccination as the preventative of small-pox. A number of the members of the State Society, by special invitation of Dr. Alexander, left Harrisburg by special train, arriving at Marietta at about nine A.M. The guests were met at the depot and speedily driven to the vaccine farms, where they were cordially welcomed by Colonel D. B. Chase, after which there was a careful inspection of the farm.

At twelve o'clock a very pleasant reception was accorded the visitors in the banqueting hall, which was beautifully decorated for the occasion with flowers, bunting and potted plants. A very pleasant feature of the reception was the well-filled lunch table, which was presided over by a bevy of pretty girls, assisted by well-trained waiters. During the luncheon a male chorus composed of sweet-toned boys, dressed in red and blue uniforms, sang some very happy selections from the old plantation songs; including, "Old Uncle Sam," "Kingdim Comin'", also, "The Soldier's Farewell" and ending up with the "Star Spangled Banner." One of the amusing features among the songs produced was an adaptation of words suitable to the occasion to a popular "Princess Bonnie" air. The words were as follows:

ONCE UPON A TIME.

Air from "Princess Bonnie" No. 5.

Once upon a time, it seems like a fairy rhyme,
An Arabian tale of an Eastern clime—once upon
a time.

Hurrah! Hurrah! Hurrah! Hurrah! Hurrah!
Our Jenner so true—welcome to you,
Upon one and all, our greetings now fall—
Hurrah Hurrah H-U-R-R-A-H!!!!!!

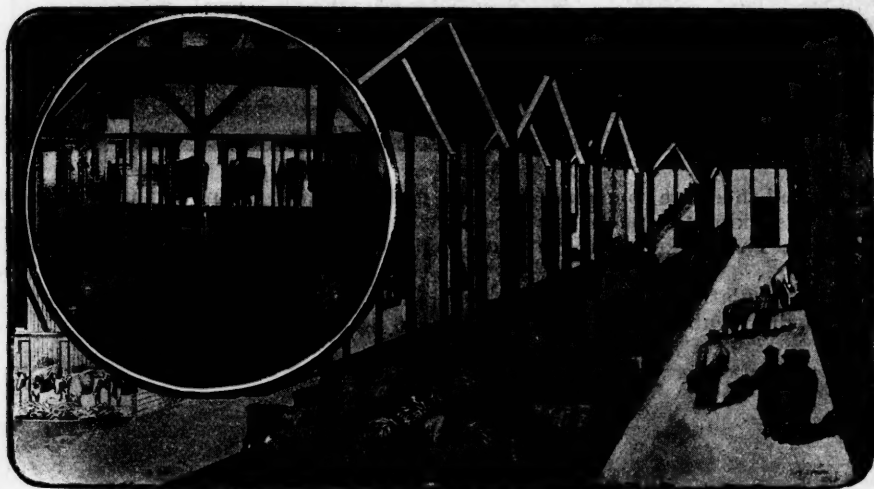
Interesting and appropriate addresses were delivered by Dr. M. R. Richards, New York, Drs. William M. Welch, E. W. Holmes, Philadelphia, and Rev. Dr. George Duncan, pastor of the Westminster Presbyterian church of Harrisburg. Dr. W. T. Bishop, Harrisburg, presided, and in his happiest manner introduced the several speakers.

The occasion was felt by every one to be thoroughly enjoyable and a complete success. Those taking part in it united most hearty acknowledgments of Dr. Alexander's courtesy and hospitality. For the benefit of those who have not had opportunity to examine the process of preparing the serum by the Alexander

tory is kept of each animal used on the farm. Here have been the mothers, grandmothers, and great grand-dames of the present progeny; and here will come the children and grandchildren of the present inmates.

Heifers under two years are selected, and are first placed in the receiving room, where they are kept under inspection and thoroughly examined for any possible diseased condition that may be present. The animals are well fed and well groomed and are kept in this room for one month, when they are removed to the inoculating room.

The operating room is a model for cleanliness, and as strict aseptic and



INCUBATING ROOM.

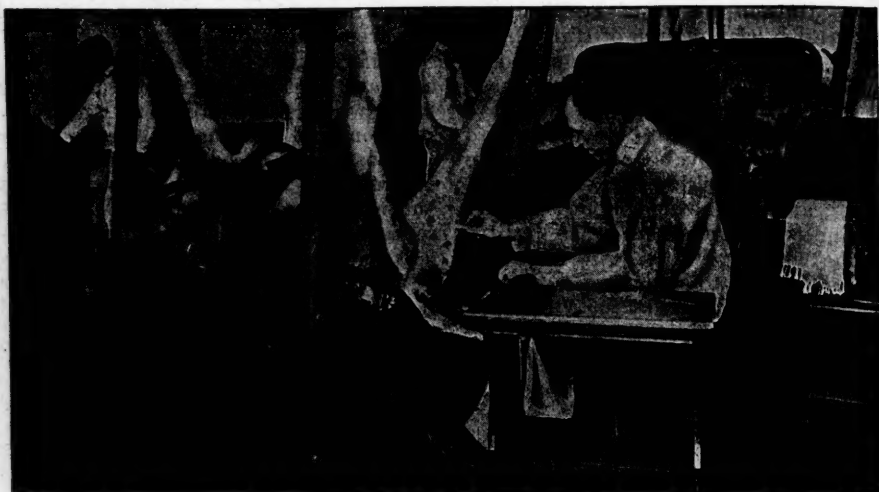
process, we give a short review from personal inspection.

The first thing with which the visitor is impressed is the fact that all the buildings are erected with the idea of the strictest sanitary welfare of the animals occupying them. So much is that the fact that it occurs to the writer that surgical operations might as safely be performed in many of the rooms, as in many hospitals that have been visited. One may pass through the whole structure without being impressed with the fact that they are in a stable. To observe the well-fed, well-groomed heifers is an acute pleasure to any stock-loving person. The stock is all selected, most of it graded, and a complete family his-

antiseptic precautions are followed as in any modern hospital. The animal is strapped down on her back and firmly held in a comfortable position upon a specially-prepared upholstered couch. The nates are smoothly shaved over a space of four inches wide by ten inches in length. The parts are thoroughly washed with bichloride solution and inoculation made in the following manner. Circular spots half-inch in diameter and separated from each other by three or four inches, are denuded of their superficial epithelium with the flat side of a scalpel. These spots are still further scarified with an ordinary vaccine comb, and are then inoculated much in the same manner as in ordinary vacci-

nations, large ivory points being used for the purpose. The denuded spaces run in a linear direction over the spaces

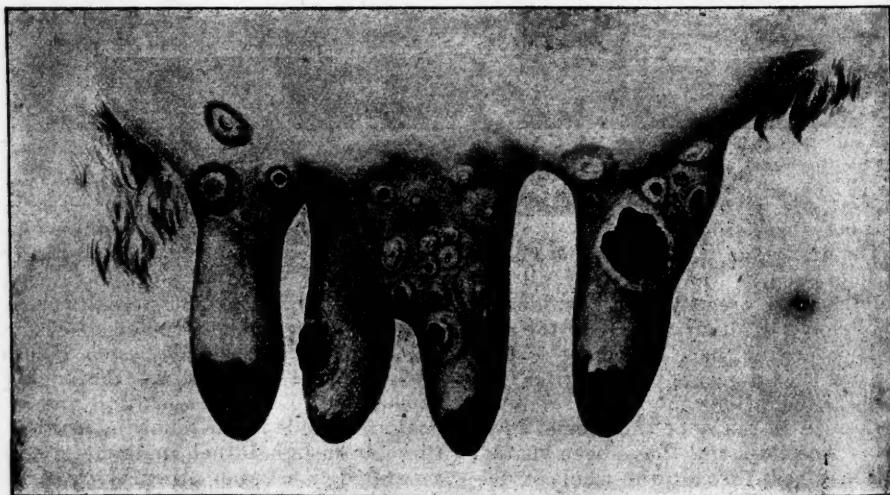
The process of inoculation is commonly followed by no special symptoms of discomfort or annoyance to the ani-



shaved, and there are commonly five on each side, making ten pustules after incubation. The diagram above shows the process.

After inoculation the animals are taken to the incubation room, which is

mals operated upon, and they eat and sleep well during the mild inflammatory process. After about ten days, at the completion of incubation, the animals are again taken to the operating room, the scabs removed, all pus washed off,



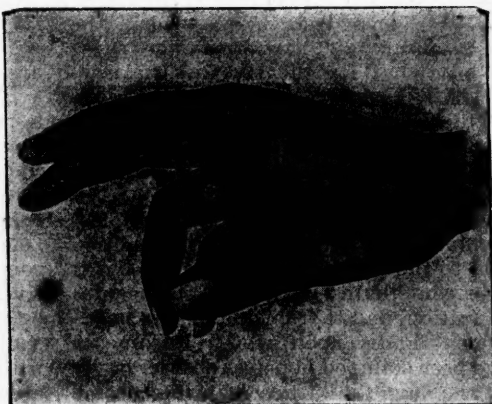
SPONTANEOUS COW-POX.

a large, airy chamber well protected from heat and flies in summer and heated in winter.

and the serum as it exudes is taken up with a suitable instrument and brushed over the ivory points which have been

previously arranged in clamps, fifty in each. After having the lymph removed the animals are taken to the discharging department, where they are kept until the vesicles have entirely healed, when they are returned to the farms from which they came.

The cattle are fed with green stuff from April to November, growing rye, wheat, crimson clover, oats, with bran mash, cow peas, etc. During the remainder of the year they necessarily get dry feed. It is found by experience that green feed and good feeding produce a better article of virus. The heifer is never inoculated a second time as it is immune after the first inoculation.



ACCIDENTAL INOCULATION FROM SPONTANEOUS
COW-POX.

SURGICAL AND MECHANICAL RELIEF FOR THE SO-CALLED HOPELESS PARALYTIC CRIPPLES.*

DE FOREST WILLARD, M.D.,†, PHILADELPHIA.

Scattered throughout the State are scores—yes, hundreds—of individuals who spend their lives helplessly upon the floor or in beds, or who are extremely limited in their means of locomotion, and only move about on crutches. Many of them never see the outside world. Some of these cases are deformed from bone inflammations, but a large proportion are deprived of locomotion by the results of various forms of paralysis.

Infantile paralysis and cerebro-spastic paralysis are the two forms most commonly met with. Anterior-poliomyelitis, with its resultant atrophy of certain sets of muscles, gives greater power to the opposing muscles, which, together with weight-bearing results in various contractions of the hip, knee or ankle, which may ultimately prevent the patient from walking, even if the muscular power is to a certain extent retained. This interference with locomotion is largely mechanical, and even an indi-

vidual of strong, normal muscles would find it difficult to walk with limbs permanently fixed in false positions.

A man, having but two feet, is in a worse position than a quadruped, since weight-bearing is interfered with if a single supporting leg is affected. Man is a plantigrade animal and needs to tread broadly upon the sole of his feet to enable him to retain the erect position. The weight of the trunk must also be transmitted to the feet in nearly a straight line. When this position is impossible, the individual necessarily is rendered helpless.

The first idea, therefore, should be to place the limb so nearly as possible in the normal position for sustaining weight, and every effort should be made to secure this condition. Until it is secured, no one has a right to say that a case is incurable or that locomotion is impossible.

Atrophy of the muscles may exist, but I frequently see the weakened muscles exert their power under the stimulating influence of motion and exercise. I have records of scores of cases who

*Read by title before the Pennsylvania State Medical Society, 1896.

†Clinical Professor of Orthopaedic Surgery, University of Pennsylvania, Surgeon to the Presbyterian Hospital, etc., etc.

for years have been helpless upon the floor, and would have remained so to this day but for the surgical and mechanical means rendered them. Some of them have been made to walk unaided for miles; others progress with the assistance of canes; others on crutches or by other aids to locomotion. All such accessories are better than helpless confinement. Not only does locomotion add to the physical development, but it also contributes largely to the mental education, and thereby increases knowledge. Faces upon whose lineaments had been stamped hopeless despair have, by the magic influence of hope, become bright and happy, and the individuals are made useful members of society.

Even atrophy of the peri-articular muscles of the hip, with contraction, though a serious condition and one most difficult to deal with, ought not to be considered absolutely unimprovable, for surgical and mechanical measures can assist even this deformity.

If the arms are well developed and strong, we can most positively expect good results, no matter how weakened are the lower extremities; but where the poliomyelitis has been high up in the cord, and where the paralysis has extended to the upper extremities, of course the difficulty is greatly increased.

In infantile spinal cases, however, the non-improvable cases are few.

In cerebro-spastic cases, of course, the benefit to be obtained will depend largely upon the brain power of the individual; but a surgeon can, even in these cases, put the patient in a condition to secure the advantage of contact with the outside world. This acts as a stimulation and secondarily results in brain development.

All the theories of the neurologists can never discourage me when I see the results of my clinical work in the most desperate and even in idiotic cases.

The staggering, uncertain gait of the spastic, often with knees striking, or actually crossed, with knees flexed and heels raised, is well known; but if the brain power is present no one need despair of securing a moderate amount of improvement, depending in degree upon the vigor of cerebral cells.

The straightening of such legs, and the sending of such individuals out into

the educating influences of the world will daily expand the cerebral cortex and improvement will result.

Treatment.—Operative interference, as a rule, should precede any attempt at mechanical support. It is useless to inflict pain when simple and safe operative measures will, in half an hour, accomplish the results in a better manner. One need not fear that a limb will become weakened in consequence of operative measures; on the contrary, it will be stronger, since the proper muscular equilibrium will be secured, and a limb with equalized muscular power must, of necessity, be more serviceable than a limb in which one set of muscles is strong and another set weak.

The one operative rule to be followed is to divide all contracted tissues, whether muscular, fascial or ligamentous. This may be done either subcutaneously or by open incision as seems advisable. In the region of important structures it is safer to see exactly what tissues are to be divided, and with thorough asepsis a speedy closure may be expected.

It is perfectly feasible subcutaneously to cut the tensor vaginae femoris and the origin of the sartorius and rectus together with the fascia without injury to any important structures; but if the contraction extends forward and surrounds the anterior crural nerve, it will be safer to make an open section.

In extreme cases, where the pelvis has been long tilted forward and the lordosis is very great, even section of the iliatus will not place the pelvis precisely in the normal position.

A longitudinal incision is better than a transverse one, as the straightening of the limb is apt to make a gap in a transverse wound.

In all cases of extensive division there is liable to be a large space beneath the anterior spinous process which is difficult to obliterate. A cavity beneath the skin, even though filled with blood, is apt to give trouble, but by close suturing and the use of a large compress it can usually be obliterated.

For thorough stretching of the contracted tissue in front of the hip, the pelvis can best be secured by placing the patient in the prone position, but care must be exercised not to injure the abdomen by undue violence.

When the adductors are contracted, producing scissor or crossed leg, their division is usually accomplished subcutaneously. This sub-dermal method is decidedly preferable on account of the fact that in cerebro-spastic cases urinary soiling of the wound is common. To remove the puncture as far as possible from the genitalia, the skin of the thigh should be drawn toward the median line of the body so that the puncture (which should be extremely small) shall, after recession, be nearly in the centre below Poupart's ligament. The saphenous vein must, of course, be avoided.

This operation must be done under the most strict aseptic precautions; the wound then should be carefully covered and excluded from possible infection. The dressing near the genitalia should be covered with mackintosh and held in place by adhesive strips, or protected by shellac.

The best dressing for the retention of the limbs in abduction is by fixing the knees by gypsum, then separating the limbs widely during the several weeks required for repair. Such dressing is also useful for keeping up extension on the divided tensor vaginae femoris and rectus.

When there is extreme lordosis, as is present in old cases of infantile paralysis, much can be accomplished by long-continued extension downward from the legs and upward from the head and shoulders.

At the knee in cerebro-spastic cases the tendons can be divided subcutaneously. In old cases, however, the contraction of the connective tissue is great; it is often wiser to do the open operation to avoid the risk of injuring the vessels and nerves; although when the tendons alone are at fault the subcutaneous operation is preferable. If two or three longitudinal incisions are made, closure is much more easily affected than by transverse cuts as the latter always gap when the limb is extended.

The worst cases to encounter are those where the patient has crawled upon the floor for years and has produced a partial posterior displacement of the tibia, together with an overgrowth of the anterior part of the condyle of the femur, producing an over-hanging bony ledge that can easily be overcome by partial resection of the knee. In some of these

cases, however, resection is of advantage, as subsequent ankylosis and fixation of the knee does away with the necessity for apparatus, and saves the patient a good walking member.

I have operated upon quite a number of these cases for this purpose. In some cases only the cartilage is pared away from the anterior section just sufficient to straighten the limb. It is then necessary to fix the leg in the descending position until ankylosis occurs in good line. It is seldom necessary to wire the femur and tibia, as a rigid dressing of plaster of Paris is sufficient.

If the operation is cleanly done no danger need be feared and primary union can be secured. The limb may be dressed in plaster of Paris, or a bracketed or a posterior splint may be used.

At the ankle, in cases of infantile paralysis, tenotomy will be required; usually the tendo-Achillis, the posterior and anterior tibials and the planter fascia in equino varus, and the peroneals in valgic cases. In calcaneus, the shortening of the tendon Achillis is occasionally necessary, with subsequent employment of a stop-joint.

In adults, the astragalus may require removal in stubborn varus, or the scaphoid may demand similar excision in particularly bad valgus.

After recovery from operation, the employment of apparatus is nearly always indicated to retain the limb in the restored position or to assist in weight-bearing.

The apparatus required varies so greatly with each individual case that it can scarcely be described, since each problem requires a careful and systematic adaptation of means to ends. The muscles should be compelled to assist to the full extent of their ability so as to develop their tone and vigor, which will steadily increase under use. When only partially useful they should be assisted by elastic or spring assistants attached to sustaining uprights.

Only when entirely helpless should lock joints be employed, but stop joints are often of service to prevent deformity. The appliance should be as light as is compatible with strength. When the arms are strong, great assistance can be given by the use of crutches,

canes, wheeled crutches, trolley supports, etc., etc. Massage and electricity are useful adjuncts.

In ankylosis following inflammatory trouble about the joints tenotomy, forcible straightening, osteotomy, and excision are all most serviceable.

CONCLUSIONS.

1—A limb contracted at the hip-knee or ankle is mechanically unfit for locomotion, but if brought into a straight line with the body it can sustain the weight.

2—Surgical measures, tenotomy, myotomy, osteotomy, or excision are frequently required to accomplish this result.

3—Subsequent support by mechanical appliances is usually necessary, together with the temporary use of crutches, wheeled crutches, or other support.

4—By a judicious combination of these measures a case having sufficient strength in the arms to assist in locomotion need not be considered hopeless.

STOMACH DIGESTION.*

FRANK H. MURDOCH, M.D., PITTSBURG, PA.

The capacity of the human stomach is from eight to fifty-six ounces. When it holds more than fifty-seven ounces, Ewald considers it to be in a condition of dilatation. During rest, the stomach should be empty or contain at most only a small quantity of clear mucus.

During digestion it becomes a closed sac. Its contents are subjected to a sort of churning motion from contraction of its walls, and, at the same time, a free secretion of gastric juice takes place from the gastric glands.

So soon as any portion of the contents becomes properly prepared, the pyloric orifice opens to allow of its passage into the intestine. This is repeated at intervals until, in the course of a few hours, the stomach becomes empty, and then the peristaltic action ceases, as does also the secretion of gastric juice, until food is again taken into it.

Gastric juice is a clear colorless fluid, of a specific gravity of from 1002 to 1003, and, besides hydrochloric acid, contains two ferments, rennet and pepsin. The amount secreted in twenty-four hours is about seven liters, or nearly one-tenth of the body weight.

The glands which secrete the gastric juice open upon the mucous membrane of the stomach and are of two classes, the cardiac and the pyloric.

The cardiac glands are tubular and

several open upon the surface by one duct. They are lined by two kinds of cells, one, forming the greater number, are the chief, central or adelmorphous cells for the secretion of pepsin and rennet. The other larger, but also granular and nucleated, are of the parietal, dilomorphous, or oxyntic cells for the secretion of hydrochloric acid. The pyloric glands are without the parietal cells, and consequently do not secrete hydrochloric acid, but pepsin and rennet only.

The epithelial lining of the mucous coat of the stomach is formed partly by columnar cells, and partly by goblet cells for the secretion of mucus.

Pepsin and rennet are not secreted by the gastric glands as such, but exist in a preliminary stage, the one as a proenzyme or rennet zymogen; the other as pepsinogen, both requiring the presence of an acid, especially hydrochloric acid, to convert them into active ferments. Rennet precipitates the casein of the milk, and with it the fat, leaving a liquid part which contains the salts and lactose. As the gastric filtrate, although neutral in reaction, may contain both rennet zymogen and pepsinogen, it should be acidulated with hydrochloric acid before making the test for either rennet or pepsin.

Rennet, like pepsin, is a constant constituent of the gastric juice, and its absence indicates atrophy of the gastric mucosa, although Einhorn has reported

* Read before the Allegheny County Medical Society.

two cases where, for a long time, there was entire absence of gastric juice, but where eventually it reappeared in almost normal quantity.

Pepsin, in the presence of an acid, has the power of transforming albumin, whether egg, serum, plant albumin, or casein, into a soluble and easily diffusible form, peptone. Propeptone is a transformation product of albumin, absent in the digestion of meat, but present in the digestion of plant albuminates and pure egg albumen, hence always found in an ordinary mixed diet. Its presence in abundance at the end of an hour after the test breakfast, indicates an abnormally slow digestion of the nitrogenous part of the food, for it should have been converted into peptone, or, at least, be found only in traces.

Ewald has shown that peptone may be formed in the presence of other acids than hydrochloric acid, especially lactic acid; and, artificially at least, a certain amount of digestion takes place at the end of an hour and forty minutes in a test tube containing a solution of coagulated albumin, water, pepsin and acetic acid; but when a similar mixture is acidulated with butyric acid, and treated in the same manner, no digestion whatever takes place (Martin).

As early as ten or fifteen minutes after taking food, the stomach contents obtained, are acid, the acidity depending for the first half-hour upon the presence of lactic acid. For the next half-hour, hydrochloric acid exists with the lactic acid; but after the first hour hydrochloric acid alone should be found. Lactic, acetic and butyric acids are not secreted by the gastric glands, but are either swallowed with the food, or formed in the stomach from the non-nitrogenous part of the food by bacterial fermentation.

The normal acidity of the gastric juice is from forty to sixty, but in patients complaining of stomach trouble, this condition is very rarely found. In a series of 564 cases examined by Einhorn, the acidity was normal only ninety-one times. In 187 cases there was too little acid, and in 286 cases, too much. In 120 cases hydrochloric acid was entirely absent. In twenty-six cases in which I have recently examined the gastric juice, the acidity was not normal in a single

instance. In five of the cases it was too low; and, in all these cases hydrochloric acid was absent, while in the remaining twenty-one cases the degree of acidity was too high.

Hydrochloric acid acts in several ways in the stomach. It stimulates the peristaltic action, it develops active ferments out of inactive proenzymes, and, with the aid of pepsin, converts albumin into peptone. It has nothing to do with the digestion of the carbohydrates of the food.

The digestion of starch begins in the mouth, the ptyalin of the saliva converting a certain portion of it into sugar. But the action of the ptyalin does not stop in the mouth, for the saliva which is swallowed with the food continues its action on the amylaceous substances, even in the stomach, until its action is arrested by the acid of the gastric juice. No further change takes place until the stomach empties itself into the duodenum, where the acid chyme, coming in contact with pancreatic juice, is rendered alkaline, and the digestion of the starch is completed.

As albumin are changed into propeptone before being converted into peptone, so starch is changed into erythrodextrin, and then into achrodextrin, before being finally converted into sugar, so that at the end of an hour after the test breakfast if erythrodextrin be found we know that the digestion of starch is abnormally slow.

The conditions interfering with stomach digestion are improper quality or quantity of food, bad teeth, insufficient mastication, absence of hydrochloric acid, too low or too high a degree of acidity, whether due to hydrochloric acid, or to the presence of organic acids, diminished absorption, and dilatation or loss of motor power due to atony of the muscular coats.

An English paper reports the discovery of a real Mrs. Malaprop. She walked into the office of the judge of probate and inquired: "Are you the judge of reprobates?" "I am the judge of probate," was the reply. "Well, that's it, I expect," quoth the lady. "You see, my husband died detested and left me several little infidels, and I want to be appointed their executioner."—*Boston Budget*.

CURRENT LITERATURE CONDENSED.

Dangers of the Lean-Meat Diet.¹

Practical experience, as well as theoretical considerations, lead to the conclusion that a lean-meat diet, continued for any great length of time, is incompatible with the highest health. For example, the leading medical teachers in France have for several years been sounding the note of warning against the use of an exclusive meat diet in diabetes, a disease for which lean meat was formerly supposed to be not only highly essential, but almost a panacea. A close study of the history of these cases has shown, however, that an exclusive meat diet is not infrequently a cause of death, through the accumulation of so great a quantity of ptomaines within the body that the overworked kidneys are unable to cope with them.

Physiological facts which are known to-day fully justify the statement that a person subsisting upon a lean-meat diet, however comfortable he may be, however much relieved from various digestive inconveniences to which he may have been previously subject, is nevertheless in a pathological state, and one which is vastly more serious than the conditions which ordinarily arise from the simple fermentation or souring of saccharine or farinaceous foods in the stomach. The acids developed by such fermentations are irritating, and produce more or less disturbance, local and reflex; nevertheless, the ultimate effects are by no means so formidable as those of the insidious but far-reaching and tissue-changing poisons which accumulate in the body as the result of a lean meat diet.

The truth seems to be that a person subsisting upon a lean-meat diet, while he may manifest a greater amount of strength than upon a more natural dietary, and may be unconscious of any abnormal condition, is like a person in a powder magazine—he is in constant danger of vital catastrophe. The poison-destroying functions of his liver and the poison-eliminating capacity of his kidneys are taxed to their utmost to keep the proportion of ptomaine and leucotoxins in the tissues down to a point

which permits of the performance of the vital functions. The margin of safety, which nature has wisely made very large in order to provide for emergencies, is reduced to the narrowest possible limit, so that anything which temporarily interferes with the functions of the liver or the kidneys, or which imposes additional work upon them, may be sufficient to obliterate the safety margin, and produce an attack of grave or fatal disease. Invasion of the body by ptomain-producing microbes, such as the typhoid bacillus, the bacillus of diphtheria, the pneumococcus of Friedlander, the shocks resulting from accident, and even the depression of a severe cold, may be sufficient to consume the meagre emergency capital, and the result is acute inflammation of the kidneys, or death under chloroform or from shock following an operation under anesthesia.

It is evidently the duty of the physician who places his patient upon a lean-meat diet, to inform him of the fact that under such a dietary he is living close to the border-line, that his situation is like that of a man walking along the brink of a precipice, that he must on no account submit himself to the influence of an anesthetic without first undergoing a few days' preparation, including an entire change of diet; and the truly wise physician will further instruct his patient that however a lean-meat diet may be considered as a temporary expedient, it cannot be safely adopted as a continuous dietary without the risk of constitutional degradation and injury.

Cycling as a Cause of Heart Disease.²

The chief danger of cycling lies in the fact that a cyclist takes much more exercise than he is aware of or than he intends to, and is frequently tempted to overtax his powers. This overtaking of strength may accompany efforts to reach a given point as laid down in plans for the day, or as is made necessary by certain exigencies. More frequently, however, the extra exertion is put forth in hill climbing. In this latter case, the heart has already as much strain put upon it as it can stand with impunity; but a glance

¹ "Dietetic Fads," *Medical Progress*, April, 1896.

² Dr. George Herschell, in *London Lancet*.

shows the rider that but a few more turns of the wheel will bring him to the top, and he redoubles his exertions, and the mischief is done. In club runs, again, while the start is made to correspond with the pace of the slowest riders, the fastest riders unconsciously quicken their pace, and the slower ones must follow at a rate entirely beyond their capacity or be left behind.

Excessive cycling, by the strain thrown upon the heart, may produce one of four conditions: (1) Simple hypertrophy. This is a compensatory effort on the part of nature to enable the work to be performed, and may terminate in recovery, in valvular disease and disease of the aorta, or in degeneration of the heart muscle. The latter condition is the common fate of a hypertrophied muscle. (2) Acute dilatation of the heart. This condition begins as soon as the cyclist shows signs of being 'short of breath.' Until this time, the blood pumped into the lungs and that pumped out into the tissues is equal in amount; but as soon as this symptom appears, there is an inequality in the delivery from the two ventricles, and if exertion is then continued, permanent damage will result. This condition may terminate in recovery, in the production of valvular disease, or in sudden death. (3) Chronic valvular disease of the heart. This trouble may arise as a sequel to acute dilatation of the heart, on account of the stretching of the auriculo-ventricular ring. It may arise as a result of hypertrophy from stretching of the aortic ring, from the giving way of a valve, or from the occurrence of sclerotic changes in the valves. (4) Functional derangement of the heart. This condition is very frequent as a result of cycling. The symptoms are palpitation, dyspnea, a sensation of sinking at the epigastrium, subjective sensations in the region of the heart, intermittency of the heart's action, and anginoid symptoms.

While the above enumerated dangers are constantly present to the cyclist, yet, in moderation and under proper conditions, it is one of the most health-giving forms of exercise, and is a potent remedial measure in established heart disease. As preventive measures against the dangers of this fascinating sport may be mentioned: (1) The use of a low gear; (2) the upright position in

riding; (3) adequate food when riding and the avoidance of muscle poisons, such as beef tea; (4) the avoidance of preparations of kola and coca, which numb the sense of weariness; and (5) on no account should a cyclist continue riding after he has commenced to feel short of breath, or when there is the slightest sense of weariness in the chest.

Report on Cases of Puerperal Eclampsia.³

About one and one-half years ago I reported before this society six cases of eclampsia, five of which were treated by the hypodermatic use of chloral hydrate. Within the past two months I have had in my own practice two more cases of eclampsia. One case was about the eighth month of gestation; the os was commencing to dilate when she was suddenly taken with convulsions. She had three convulsions before I could deliver. The other case was a primipara, confined a little before the termination of the ninth month. The labor proved normal and was not of unusual duration. As everything about the case seemed normal I had not made an examination of the urine. In the previous case I had, about four weeks before the birth of the child, and found no albumen. In the second case, as I have stated, I did not make an examination. About twenty-nine hours after the birth of the child, she was taken with eclampsia and upon an examination the urine was found heavily loaded with albumen. The woman, however, had but one convulsion. I was called a few minutes after the convulsion and found her unconscious. In this case I used five grains of chloral hydrate hypodermatically. In addition to the drug, I subjected her to the wet pack and no convulsions followed. In both cases, the results obtained from the chloral hydrate were excellent.

I speak of these cases this evening, because I have been following the use of this remedy in some nine cases of my own, and counting those seen in consultation with other physicians, over a dozen cases, and in all of these there has been but one death and but one case in which there seems to be any mental disorder following the attack of eclampsia, something rather unusual.

³ Dr. J. J. Green, before Allegheny Co. Medical Society

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PHILADELPHIA, SATURDAY, OCTOBER 17, 1896.

EDITORIAL.

THE DISCOVERY OF ANESTHESIA.

Fifty years ago, under the critical eyes of sceptical and unsympathetic medical men, in a public hospital, with none to share the responsibility for an experiment which jeopardized human life, and with no other resources than his own limited experience, a courageous dentist dared a demonstration which resulted in the immediate discovery to the world of an inestimable blessing. Friday, October 16, 1846, in the surgical service of Dr. John Collins Warren, at the Massachusetts General Hospital, William Thomas Green Morton administered sulphuric ether by inhalation, and produced thereby unconsciousness

to a degree which rendered the subject totally insensible to pain and happily oblivious to the terrors of a surgical operation. Then was brought to pass what Oliver Wendell Holmes has written: "The fierce extremity of suffering has been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed forever."

The date marks an epoch in history. The news of that portentous operation resounded throughout the civilized world. Nepenthe, the dream of poets, the quest of philosophers, the prayer of sufferers, was realized, and William

Thomas Green Morton was heralded one of the great benefactors of mankind.

The records of the Massachusetts General Hospital relate the circumstances of the operation. An extract quoted in the *Occidental Medical Times* gives an interesting account of the occasion:

"Gilbert Abbott, aged twenty, painter, single; tumor on face. * * *

"This case is remarkable in the annals of surgery. It was the first surgical operation performed under the influence of ether.

"Dr. Warren had been applied to by Mr. Morton, a dentist, with the request that he would try the inhalation of a fluid which, he said, he had found to be effectual in preventing pain during operations upon the teeth. Dr. Warren, having satisfied himself that the breathing of the fluid would be harmless, agreed to employ it when the opportunity presented. None occurring within a day or two in private practice, he determined to use it on this patient. Before the operation began, some time was lost waiting for Mr. Morton, and ultimately it was thought he would not appear. At length he arrived, and explained his detention by informing Dr. Warren that he had been employed in preparing his apparatus, which consisted of a tube connected with a glass globe. The apparatus he then proceeded to apply, and after four or five minutes the patient appeared to be asleep, and the operation was performed as herein described. To the surprise of Dr. Warren and the other gentlemen present, the patient did not shrink or cry out; but during the insulation of the veins he began to move his limbs and utter extraordinary expressions, and these movements seemed to indicate the existence of pain, but after he had recovered his faculties he said that he had experienced none, but only a sensation like that of scraping the part with a blunt instrument, and he ever afterward continued to say that he had not felt any pain."

Dr. Morton was the man to whom, by common consent, the world accords the chiefest honor for the discovery of surgical anesthesia, and this was the occasion which medical science accepts as its introduction and now commemorates by special observation of its fiftieth anniversary. Preëminent honor and glory is due to William Thomas Green Morton.

Yet, while pæans are sung in praise of Morton, due honor must be accorded to the man of science, the ripe scholar, who

provided the opportunity for demonstration of what was but an empirical conclusion, and set the seal of his great reputation upon another's chance discovery to certify the fact and gain for it at once the serious attention of the scientific world.

Too little merit has been awarded to Dr. John Collins Warren for his part in the discovery. What this was will be evident when it is remembered that Dr. Warren was a most eminent surgeon of his day; that education and experience had shown the futility of every effort hitherto to eliminate pain from surgical procedures; that he was fully aware of the recent humiliating exhibition of Horace Wells, and the failure of "painless tooth-pulling" under the anesthetic influence of nitrous oxide; that he knew Morton was Wells's assistant upon that occasion; that he knew Morton, though a practicing dentist, was but a student in medicine, with only a student's knowledge of physiology and chemistry; that he himself was ignorant of the exact nature of the agent to be used; that all the precautions he could take were, at best, most unsatisfactory. He knew that failure entailed reproach and fatality meant disaster to himself. Dr. Warren was not foolhardy nor inconsistent. His decision was neither rash nor reckless. His attitude was conservative. But his was the conservation of humanity and of progressive science inspired of reasoning courage, and not the counterfeit "conservatism," the lion-skin disguise of long-eared arrogance and calculating cowardice.

A curious phenomenon is commonly observed in the promulgation of any new thing. It is too often met with in medical science. When a new idea is introduced, whether it be a great discovery, an operative procedure, an appliance, or perchance an instrument, even so insignificant as a catheter, no

sooner has its actual value been established than there arises a host of "priority" claimants who hesitate at nothing to become known of men. It was so with anesthesia. The story of its advent involves a dark tragedy and the most acrimonious and disgraceful contention in the annals of American medicine. But after fifty years the atmosphere has cleared enough to permit the righteous award of the honors involved.

George Foy, of Dublin, whose classical work on Anesthesia proves his right to speak with authority on the subject, in a letter to the *REPORTER*,* presents the claims for honorable mention of Thomas Beddoes, Richard Pearson and Sir Humphrey Davy, and incidentally relates the latter's first experience with nitrous oxide. These names are entitled to mention in the record, although their knowledge, practice or suggestions had nothing to do with the discovery and introduction of surgical anesthesia. The attempt of Sir James Y. Simpson to appropriate the glory of the great discovery may be considered as a temporary aberration of candor. The world knew the facts and eventually Sir James Y. Simpson himself gave credit where it was due. Although he did not discover or introduce anesthesia, he is entitled to highest honors for the invention and establishment of chloroform as an anesthetic, and especially for its obstetrical application. A few years since, Sir John Lubbock ascribed discoverer's honors to Sir Humphrey Davy and Sir James Y. Simpson. But the fact that he excluded other names must be regarded as the result of an insular idiosyncrasy rather than essential ignorance of the subject.

Surgical anesthesia is universally admitted to be the product of American genius. There are four names inseparable

from its early history; three of them in association with each other, the fourth independent of the rest. One of the three receives supreme honors, and rightly. To the fourth belongs, if not the chiefest glory, great honor and undiminished personal respect.

If Horace Wells receives the credit for discovering nitrous oxide anesthesia, he has his full reward. His claim to a share in the discovery of surgical anesthesia by sulphuric ether is spurious and discreditable.

The deeper the examination of the claims of Charles T. Jackson, the deeper is his name involved in obloquy. That he had any standing in the contest, beyond the fact that he "suggested" to Morton the possible usefulness of sulphuric ether in the latter's experiment, was due to Morton's greed of gain. Morton endeavored to disguise the nature of the agent used by calling it *Letheon*, and under this name secured a patent. Jackson knew what the agent really was, and to prevent his divulging his knowledge, Morton allowed him a share in the patents. Fortunately for the world, sulphuric ether was immediately recognized despite its spurious name, and the effort to make its virtues a matter of barter came to naught. The patent was secured to enrich the owners. The only returns were dissension, disgrace and disaster, culminating in tragic death for each of the three men concerned.

The fourth name is that of Dr. Crawford W. Long, an obscure general physician, in the rural districts of Georgia. The history of Dr. Long's connection with anesthesia, together with the vouchers for his claims, has been clearly presented by Dr. Luther B. Grandy, in an article published originally in the *Virginia Medical Monthly*, from which a full abstract was made for the *REPORTER*.*

*Vol. LXXIV, No. 11, p. 345, March 14, 1896.

*Vol. LXIX, No. 17, p. 646, October 21, 1893.

There can be no doubt but Dr. Long was the first in point of time to discover anesthesia by sulphuric ether, and he was the first to apply the discovery to surgical procedures. Moreover, Dr. Long made no effort to keep secret his discovery, or the nature of the agent used. On the contrary, his work was common knowledge throughout the locality in which he practiced. But for some reason, either because he did not apprehend the full meaning of his discovery, or because of his isolated situation, or because he considered his experience insufficient to justify scientific conclusions, he failed to put his work on record, or even to make a preliminary announcement. He did not publish his discovery for the benefit of the profession and of the world. That was a cruel fate which, having bestowed the great fortune of making an immortal discovery, deprived the discoverer of the right to have his name written among the very foremost in the glorious list of benefactors to humanity. In one respect, at least, he stands preëminent. His motives were the purest, being without unworthy, selfish considerations. And he alone emerges from the bitter conflict with unstained personal honor and the undiminished respect of the world.

Everything considered, the decision awarding supreme credit to Dr. William Thomas Green Morton is righteous and satisfactory. Dr. Morton did not discover the condition of insentient passiveness produced by drugs, to which Oliver Wendell Holmes most happily gave the name anesthesia. From a time beyond which the memory of man goeth not, anesthesia by alcohol was the common knowledge and the not infrequent practice of articulate-speaking men. And there were other agents known and used to secure insensibility to pain. Neither was he the first to produce anesthesia by sulphuric ether; nor was he

the first to apply anesthesia in surgery. But Dr. Morton's invention was original with himself. It was not the outcome of accidental discovery, but was the result of arduous and continuous labor. He started with a fixed purpose, and persevered in his efforts despite frequent and most discouraging failure. He tried one thing after another, making experiments upon himself. He was finally rewarded with the independent original discovery of the anesthetic properties of sulphuric ether. He did not rest content until he secured the publication of his discovery, and confirmed its truth by an incontrovertible demonstration of his achievement. He knew nothing of Dr. Long's work. Neither did the world.

Dr. Morton's triumphant demonstration, confirmed by the unquestionable authority of John Collins Warren's great reputation, both personal and professional, was the first authentic knowledge that an object, despaired of for centuries, was successfully realized.

A case in which abdominal section by a cow's horn was performed without fatal results in a non-pregnant woman is recorded in the American Journal of Obstetrics by Dr. Skilling. The injury is of interest in relation to well-known instances of successful cesarean section carried out in the same manner. Skilling was called in shortly after the accident. The patient lay in bed, her clothing saturated with blood. Her countenance was anxious and pale, but there was only slight evidence of impending shock. The cow's horn had entered the abdomen just above the symphysis, a little to the right of the median line, and ran obliquely to the right, making a rent six inches long. The peritoneum was involved; the intestines protruded; loss of blood was relatively trifling. The intestines were replaced, the peritoneum closed by a continuous suture of fine silk, and the remaining layers of the parietes by interrupted silk sutures. Recovery was rapid and complete.

ABSTRACTS.

VERATRUM VIRIDE IN PUERPERAL ECLAMPSIA.*

CASE 1. Mrs. J. K., aged seventeen and one-half years, primipara, at about full term was seized, without premonition, with a convulsion, once became unconscious, and one convulsion followed another in rapid succession, averaging four attacks every hour for six hours, until I saw her. A hasty examination of the abdomen revealed a gravid uterus at about full term. The full, quick pulse, that fairly snapped, giving the impression under the finger as being ready to explode upon the slightest compression, rate from 80 to 90, the general arterial excitement and nervous phenomena, all exactly fitted the classical description of puerperal eclampsia.

I quickly injected fifteen drops of Norwood's tincture of veratrum viride. The pulse at once softened and arterial tension abated somewhat. In fifteen or twenty minutes she had another convulsion of less marked duration and severity. About five or six minims more of the veratrum was injected within thirty minutes after the first dose. She had one more convulsion two and one-half hours after I first saw her, or two in all after the initial dose of veratrum.

Further examination revealed a dilatable or slightly dilated. I attempted to enhance dilatation as best I could with the fingers, in order that delivery should be accomplished as soon as possible, and, when dilatation had advanced sufficiently, forceps were applied without much difficulty and delivery accomplished of a stillborn child, evidently at full term. Efforts at resuscitation were fruitless. The third stage was completed without delay. The patient was put in as good condition as possible, and some hours later was left for the night, with the prognosis in doubt, though hopeful.

I used a catheter at my visit in the morning, and drew off several ounces of

urine, which proved to be nearly one-half albumin. She passed rapidly and favorably into convalescence. The kidneys soon acquired their normal functions and albumin practically disappeared within a fortnight. Medication mainly consisted of Basham's mixture supplemented by appropriate diet and systemic tonics. For two days we used hot water uterine and vaginal injections with bichlorid 1-5000.

CASE 2. Mrs. F. K., aged thirty-nine, was at about the eighth month of her second pregnancy, the first having terminated at full term in an uneventful manner about fourteen years before.

In the early months of her pregnancy she had an attack of rheumatism, accompanied by heart and kidney trouble, that nearly proved fatal. She never fully recovered, and throughout the summer she was a continual source of anxiety. She, however, managed to oversee and attend to her household duties until she was seized with a convulsive attack. Rapid delivery was decided upon and accomplished without much difficulty within four hours of her first convulsion. She had one or two convulsions in the meantime, and received fifteen minims of veratrum subcutaneously, followed within an hour by a second dose of five or six minims. Her circulation was fairly good and mind comparatively clear, so that she replied intelligently to simple questions. She was delivered of a male child of good proportions at about the eighth month, which lived about thirty hours.

Everything now apparently betokened a favorable termination. The pulse was comparatively soft, yet full, though giving no evidence of arterial excitement or increased pressure. The mental condition was clearing. The stomach was somewhat irritable from the large doses of veratrum. Altogether she was as well, if not better, than could be expected from her history of nephritis, with its attendant edema and dropsy which

* M. M. Bauer, M.D., before the Union Medical Association of Northeastern Ohio, June, 1896.

annoyed her all these months. A few hours later there was a return of the convulsions in an aggravated form which, in about twelve hours after her delivery, terminated fatally—asphyxia and exhaustion. In all she had six or seven convulsions.

To me these two cases were full of interest, occurring, as they did, within three or four days of each other, and having only a few points in common.

CASE 1 gave a history of dropsy and edema of the extremities in the later months of pregnancy, and was seized with the sthenic form of convulsions, if the term is admissible, which continued almost without interruption, and with increasing severity for more than six hours, and promptly yielded to vigorous doses of veratrum viride. The mental faculties were completely obtunded for four days; the kidneys rapidly assumed their normal condition, at least so far as chemic tests demonstrated, and a general convalescence went on from the termination of pregnancy at full term in an uneventful career. Altogether the case looked very unpromising from the start.

CASE 2 gave a history of rheumatism with endocarditis, followed by nephritis, dropsy and edema, labor setting in at about the eighth month with a convulsion of an apparently milder type; at any rate, the arterial excitement was

not so marked; the convulsions were not so violent; consciousness returned in part after the convulsions, except the last one, there being but six or seven, about fourteen hours intervening between the first and the beginning of the last one, death ensuing from asphyxia in about fifteen or sixteen hours after the first attack. I am satisfied that in this case veratrum had a modifying influence.

Veratrum viride in eclampsia, in large doses from ten to twelve minims, preferably hypodermatically, is said to be distinctly an American practice. Dr. Herbert Fearn, of Brooklyn, in 1871, reported thirteen cases treated with veratrum in very large doses without a death. Later, Rushmore and Jewett, of Brooklyn, Oatham, of California, and Reamy, of Cincinnati, collected series of cases and called attention to the great value of this drug in the treatment of eclampsia. The dosage should be large, the state and condition of the pulse being the guide. Jewett says, "Experience seems to justify the statement that no convulsions will occur while the patient is sufficiently under veratrum to hold the cardiac pulsations below sixty per minute." The initial dose can safely be from ten to twenty minims, followed in thirty minutes or an hour, if necessary, by a smaller dose of from five to eight minims.

THE EFFECTS OF SNUFF ON THE HUMAN SYSTEM.*

Perhaps there is no article of commerce so common or more in demand, or has, comparatively speaking, a greater sale than that of snuff, especially in the Southern States, and there is certainly no article of commerce that is getting in its deadly work more surely and insidiously. Physicians generally seem not to have taken into due consideration its vast and deadly effects on the human economy, especially on that of the female organization, for by far the greater consumption of this article is by the women and girls of the South, mothers and daughters rival-

ing each other in the consumption of this noxious article.

It is a well-attested fact that snuff is an acro-narcotic poison and a positive debilitant, paralyzing to a greater or less degree all the functions of the nervous system, inducing palpitation of the heart and heart failure, and also a long train of cardiac affections. We have nausea, vomiting, chronic torpidity of the liver and its functions, vertigo and neurasthenia, the peristaltic movements of the intestines checked or sensibly impaired, micturition deficient and irregular, and at periods characterized by an unnatural flow, loss of appetite, foul breath, irregularity of pulse, insomnia,

* W. K. Grayson, M. D., Florence, Tex., in *Texas Medical News*.

impaired digestion, imperfect vision, loss of memory and failure of the mental powers, etc., etc. This statement is not exaggerated, overdrawn, or too high colored. Of course, all of these enumerated symptoms are not present in each and every case of snuff poisoning, but some of them are present in every case. The entire system is impregnated with its deleterious poisonous influence and odor, even to the breath and skin, as is it also on the nursing mothers' milk. How often is the physician called upon to treat a female patient; he makes his diagnosis, prescribes medicines to meet the exigencies of the case; what is his surprise and chagrin to find his prescriptions and medicine valueless, because, unknowingly to him, the patient is a snuff slave, and its use daily and hourly has thwarted and counteracted the beneficial action of the prescribed medicines. Physicians cannot be too careful in making very particular inquiry as to the habits of their patients; indeed, it is their positive duty to do so, both to themselves and their patients, of course with all due courtesy and politeness.

Permit me to give two typical cases coming under my personal observation. A gentleman came to me to consult me in regard to his wife, and requesting me to go and see her, saying she was troubled with nervous tremors, palpitation of the heart, insomnia, and general debility. On visiting her I found her condition about such as described by her husband. Skin very sallow, tongue white but browned over by snuff, breath repellant with the foul odor of snuff, and her general system in a very debilitated condition. I found upon strict inquiry that she was using, and had been using, a bottle of snuff per week, at all times during the day, and frequently at all hours of the night. Madam, said I, are you a clean woman? She looked at me rather indignantly and replied that she claimed to be so, asking me did I see anything about her person, apparel, or house indicating otherwise. I replied that I did not. Still, I said, madam, you are not clean physically. I will apply a test, or rather, you can apply the test yourself. If, upon applying said test, you pronounce yourself clean, I will treat your

case free of charge. The challenge was accepted in good faith. I then directed her, on retiring at night, to divest herself of all clothing, envelope herself in a well-wrung wet sheet, lying in the same until early dawn, then remove the sheet and hang it out in the open air, and then tell the result of the experiment. She tried the experiment the same night and I saw her the next day, and she gave up without argument. In this case the use of snuff was totally abandoned at my request, and the patient treated strictly on hygienic principles, and in consequence she became a healthy, hearty, stout woman, and furthermore, a very grateful one, always giving great praise and sincere gratitude to the doctor.

The other case I will refer to quite briefly. I was called hurriedly from home to go a distance of sixty miles to see the only daughter of Judge P., who was pronounced by two well-known and competent physicians to be dying with pulmonary consumption. I was not sent for to take charge of the case, but merely to give my opinion in the premises. After a very careful and thorough examination, my diagnosis was snuff poisoning. After the death of the patient an autopsy was permitted by the parents. The lining membrane of the lungs was found to be thoroughly saturated with snuff, and also nearly every internal organ of the body. After the death of the young lady, a young female negro domestic said that her young mistress had used a bottle of snuff per week, charging her not to let her mother or any of the relatives or household members know anything about her using the article anyway.

I have thus briefly outlined the two cases as given above, hoping that some of the lay readers of the pages of your valuable periodical may appreciate the danger signals thrown out through its columns. Solomon says, "A word to the wise is sufficient."

Physician at Receiving Hospital (to driver of ambulance)—"Where are you going now?"

Driver (who has just brought in injured citizen)—"I'm going back to pick up the three people I run over while coming here with the patient."

OUR SELF-PRESCRIBING PATIENTS.*

To such as have studied the causes of the present decline in professional work it becomes a serious question whether there are not other elements than those attributable to stringent business relations that explain the condition. While the science of medicine has made great progress in the methods of diagnosis and treatment, the physician finds that his vocation, although more honorable and useful, is really less remunerative, and his legitimate practice is proportionately curtailed. There is no less sickness in the world, but the number of patients has markedly decreased. In fact, the sick ones are inclined to get the better of the doctor and to act more or less independently of his direct ministrations. It is not difficult to understand why this is so, when we consider the vast number of persons who willingly yield to the growing habit of prescribing for themselves. This tendency is fostered by the belief, in the majority of cases, that such prescribing is tacitly sanctioned by the profession itself by the use of many of the legitimate remedies so frequently ordered for the relief of the more common ailments. There is a very reasonable foundation for this conviction, and its responsibility rests more or less on the prescriber himself.

At the bottom of the whole business is the prevailing practice of delivering private clinical lectures to the patient on the nature, extent, progress, and outlook of his malady, and the indications for the use of special drugs in the treatment of certain conditions. While this may give evidence of remarkable learning on the part of the medical adviser and may help for the time being to establish his methods in the confidence of his client, it too often educates the recipient into the presumption of thinking and acting for himself. The most superficial knowledge is all that is necessary to this end, and, easily persuading himself that he has a repetition of the malady of which he has had such an authoritative opinion, he either repeats the prescription at will or purchases his former remedy in open market at the coun-

ter of the obliging pharmacist. Quinine, phenacetin, salol, morphine, pepsin, the mineral laxatives, and a host of other much-used medicines are given the currency of indispensable household articles. To such persons a diagnosis is a useless refinement, it being sufficient for their special purpose that their physician has given explicit directions how to use the supposed harmless remedies under what the patient believes to be similar circumstances. Not only this, but the remedy is freely prescribed to all his friends who are willing to trust to the blind chances of having a like ailment.

With shame be it said that very many of the pharmacists, far from discouraging such practices, not only willingly abet them but offer special inducements to purchasers by peddling the favorite prescriptions of well-known physicians. These drug sellers, for they deserve no more dignified title, do not prescribe themselves, but are willing to recommend the prescription of another, charging a round price for the trouble of dispensing it. When it is understood that the physician knows of this, it is not difficult to explain why so few prescriptions are written and why so many prescribers deal out their own medicines.

Aside from the purely business aspects of the question, this inconsiderate self-prescribing is in the highest degree detrimental to the community at large in stimulating an unnecessary consumption of drugs, in the formation of habits which eventually undermine health, and in directly jeopardizing life by the loss of valuable time in the prompt recognition and scientific treatment of many of the dangerous and insidious maladies of which the ordinary patient has no possible knowledge. The profession should always be ready with any information tending toward the prevention of disease, but any attempt directly or indirectly to teach therapeutics is fraught with untold evil to the giver and the receiver. The more the patient is kept in ignorance of the remedies prescribed, the better for him, and certainly, under the circumstances al-

*Editorial in *Medical Record*, September, 1896.

ready named, the better for the prescriber. The physician is never called in consultation with his patient, as the very nature of the case precludes the necessity of more than one opinion. The moment any argument is allowed on this

point all proper respect for purely professional opinion is lost. This is one of the results of selling the birthright for a mess of pottage. The lesson is one which many of the too-obliging practitioners can take to heart.

NEGLECT OF THE TEETH IN COUNTRY DISTRICTS*

It is not generally known to the public, but it is an indisputable fact, that in no part of the Dominion is there more neglect of the human teeth, and more ignorance of their functional importance, than in the country districts of the Province of Quebec, and no less among the English than the French population. Physicians in Ontario, as a rule, avoid interference in the diseases of the teeth, excepting where there is no dentist within their limits, but in Quebec we have known, upon several occasions, young successors to medical men receive as one of the legacies of practice of their predecessor large jars or bottles full of extracted teeth, 90 per cent. of which a dentist would have saved! We have had many opportunities to observe the serious extent of the various diseases of the teeth in the eastern townships especially, and to learn from intelligent country physicians who do not make a business of extracting these organs that the constitutional and especially the nervous affections due directly to diseased teeth are alarmingly on the increase.

A large number of the affections of the eye and ear are traced to abnormal conditions in the mouth, and which get no radical cure excepting through proper dental treatment by experienced dentists. Digestion is impaired on account of the absence of the teeth. Beauty not only loses one of its chief charms, but strength loses one of its important aids. Sandow once said that he never knew a man of great strength who was a victim of dyspepsia, or who had bad teeth. There is no more common cause of headache, neuralgia, diarrhea, and various other disorders than diseased conditions of the teeth, and it

is astonishing to reflect that in the mouth, the portal of life and health, many people will tolerate filthy conditions which they would not endure in any other part of the body. A whole train of obscure nervous and sympathetic affections owe their exciting cause to diseased teeth. There may be no decay or pain frequently, but the ears, the eyes, the stomach, the head, etc., suffer. The teeth are not merely mechanical mills to grind food, requiring only mechanical treatment by mechanically-educated men. They are as important and necessary to the mouth as the fingers to the hand; and even were it not so, the suffering following their neglect, and the decline of general health due to their loss or disease, should impel people to pay them more attention. It has been said that it is a wise dentist who knows his own teeth, and it is a fact that no one can faithfully examine his own or discover the beginnings of decay.

The sufferings endured by hundreds of neglected children, due to the silly superstition that the loss of temporary teeth, which should last seven years, is no functional loss, is something appalling in Canada, especially in country districts. Our farmers' families, especially, are martyrs to the effects of bad teeth, and frequently bad dentistry. They wait "until the tooth aches," and foolishly expect then that the dentist can perform a miracle upon an organ which, by the death of the "nerve," has lost its chief nutrition, or they let the physician extract it. It is questionable if the care of the teeth of cattle would not become popular if it could be proved that it would add to their market value, and yet the care of the human teeth, which contribute so much to the health of the entire body, is overlooked! No doubt

*Editorial, *Dominion Dental Journal*.

some of the prejudice entertained by country residents against dentists is due to the quacking and imposture of uneducated practitioners, who go about seeking teeth to extract and patients to swindle. But there are plenty of honest and skilful dentists; and it would be as

unreasonable to condemn a whole profession for the iniquity of one, or even a whole practice, because of an occasional failure, as to condemn the entire practice of medicine because there are quacks in it, or because death occurred where recovery was expected.

SOCIETY REPORTS.

ALLEGHENY COUNTY MEDICAL SOCIETY.

August 18, 1896.

STOMACH DIGESTION.

[See page 494]

DISCUSSION.

DR. S. L. McCURDY.—I should like to have the reader of the paper explain, later on, just what he means by the test breakfast.

DR. J. I. JOHNSON.—I wish to bring up a matter which, although not exactly in the line of stomach digestion, certainly has a bearing upon it. A young lady applied for relief who was suffering from a stricture of the esophagus. She had not eaten meat for a number of years. One day when she was feeling exceptionally well she ate a little piece of meat. It lodged in the esophagus and then she could swallow nothing at all, not even liquids. She applied for relief and we tried to pass a tube, but although we made quite a number of attempts we were unsuccessful, but in removing the tube we noticed some disintegrated pieces of meat. One of the house doctors standing by suggested the plan of introducing a meat digestive principle into the esophagus. We gave her some essence of pepsin and hydrochloric acid. We followed this treatment again in a few hours, and the next day the patient could swallow liquids without any more difficulty than she had experienced before eating the meat.

DR. ADOLPH KENIG.—The better we understand the physiology of digestion the better we are able to apply our remedies in conditions where the digestive organs fail to do their usual work; but as digestion, primarily speaking, is a matter of glandular activity, it seems to me rather reasonable to expect very little good effect from the administration of artificial digestants, except in so far as they, for the time being, allow the patient to receive a little more nourishment, but the administration of these remedies does not increase the glandular activity. I have recently had some experience with another remedy

that seemed to act well where the enzymes seemed to have but little effect. Potassium iodid given in small doses seemed to act almost like a charm. I concluded it was due to the stimulating effects produced by the iodid upon the glandular system. In my experience this drug has produced most excellent results in functional gastric derangements.

I should like to have a little more information regarding the rennet substance in the stomach, the milk-curdling substance.

DR. J. J. GREEN.—I would like to ask Dr. Kenig about the duration of the beneficial effects resulting from the use of the iodid.

DR. KENIG.—The good results are reasonably permanent, but any error in diet will cause a recurrence of the indigestion.

DR. FRANK MURDOCH said in conclusion: In regard to the test breakfast, I would say that there are a good many different kinds, but the one commonly used is Ewald's, and that consists in giving the patient a single Vienna roll to be eaten slowly and thoroughly masticated. No butter is given with the roll, but the patient is permitted to drink a cup of tea without cream or sugar. An hour after this test breakfast has been eaten, the contents of the stomach are taken and analyzed.

I considered the action of rennet pretty thoroughly in my paper. Both rennet and pepsin are secreted by the small or central cells of the gastric glands. The rennet we know is present from earliest infancy, because infants can digest milk very well, but it does not exist as rennet; it exists as a rennet zymogen and requires the presence of hydrochloric acid to effect the change. Sometimes we see gastric juice that is neutral in reaction, and yet it contains the rennet zymogen, and if we add a little dilute hydrochloric acid to the portion of the gastric filtrate it will then curdle milk, although it would not have pro-

duced this action before the addition of the acid.

REPORT OF CASES OF PUERPERAL ECLAMPSIA.

[See page 497]

DISCUSSION.

DR. G. W. MCNEIL.—My attention was called to the use of chloral hydrate by Dr. Green. Since that time I have had an opportunity to test it in three cases. In the first case, a primipara, after the labor had progressed for some time a violent convulsion occurred. I used inhalation of chloroform and delivered at once with forceps. After delivery the convulsions continued; I then used chloral hydrate, hypodermatically, five grains in warm water; repeated the same dose in one hour, making in all three injections, after which convulsions ceased. Albumen was found in

the urine; the mental condition was slow and sluggish for one week.

The second case, a large plethoric woman, was taken with eclampsia in her first confinement as labor was progressing; I used chloroform until the child was delivered, and then chloral by injection; three convulsions occurred after delivery; this patient had albumen in the urine. The mental condition improved slowly. She did not know she had convulsions until told of the fact.

The third case, also a primipara, had labor ushered in by convulsions. She was delivered by instruments, and chloral administered hypodermatically, and had but one convulsion after delivery. Her recovery was rapid, and no mental symptoms whatever followed. I think the drug is worthy of careful trial. I have the utmost confidence in its safety. The rapid relief from convulsions and the clearing of the urine that follows, is astonishing.

PERISCOPE.

SURGERY.

A New Method of Treating Pneumothorax.

Futterer (*Medicine*, June, 1896) describes a case in which a patient came under his observation with right pneumothorax, originating in a perforation of the pleura of the right lung, apparently owing to a tubercular affection, though tubercle bacilli were not found.

The patient had lost forty pounds in weight; he was anemic, had an anxious expression, and breathed very heavily. The right half of the chest was distended; there was a small quantity of fluid in the right pleural cavity, and succussion was elicited. The apex of the heart was pressed over to the left median axillary line; the diaphragm was pressed downward, and the liver also, the latter almost reaching the umbilicus. The temperature varied somewhat, the highest, during the first three days, being 102.8 degrees; the pulse varied between 98 and 112, and the respirations between 32 and 40.

Dr. Futterer decided to try to again create a vacuum in the right pleural cavity, but waited some weeks to allow the patient to recover from the nervous shock and to gain strength, as well as to permit the perforation to heal up.

Twenty-nine days after the perforation, a trocar and tube were introduced into the right pleural cavity, a little to the right of the middle line, in the first intercostal space of the right side. The trocar was withdrawn and the tube left in position. Another trocar and tube were introduced into the pleural cavity through the sixth intercostal space in the middle axillary line, and through this tube

the whole right side of the chest was filled with a sterilized and filtered mixture of a 0.75 per cent. solution of oil of cloves and water, oil of cloves being the most powerful and least harmful antiseptic against the tubercle bacilli. The patient was in such a position that the place where the upper tube had been introduced was about the highest point of the right side of the chest, so that by filling the pleural cavity with liquid most of the air contained in the pleural cavity was forced out through this upper tube. When this had been accomplished as well as possible, the upper tube was removed, and the opening closed by cotton and collodion. The patient at this time was breathing heavily; was pale, cyanotic, and covered with perspiration. Some of the liquid was at once removed, lowering the level to the second intercostal space; the lower tube was then taken out and its opening closed in the same way as the other, and the patient was then left, no longer complaining of discomfort. The apex of the heart was now pressed over to the left posterior axillary line.

A fortnight later, 1,000 cc. of fluid were aspirated, and five days later the apex beat was found in the sixth intercostal space at the anterior axillary line.

The first and second intercostal spaces showed retraction; the liver dullness extended one and three-quarter inches below the costal arch in the right mammary line.

Eight days after the aspiration of 1,000 cc., 1,200 cc. of liquid were removed by aspiration, and a few days after this the apex beat was found one and one-eighth inch outside the nipple line, and one inch inside the anterior axillary line. The liver dullness extended only one and one-eighth inch below the costal arch in the right mammary line. Over the

right lung breath sounds could be heard over the apex in the first, inner half of second and inner half of third intercostal spaces.

A portion of the liquid aspirated on this occasion showed no development of bacteria after inoculation into culture tubes containing serum.

A further aspiration of 1,000 cc. of liquid was made later on, the apex beat after this being only one-eighth inch outside the nipple line, and the liver dulness moved upward. Air was still present in the pleural cavity, as indicated by the possibility of obtaining succussion; but the condition of the patient was much improved; he both looked and felt well.

The author thinks he might have aspirated larger quantities at a time, and shortened the intervals in order to hasten recovery, but he desired to have longer contact of the bactericidal liquid with the pleura.—*Med. Chron.*

THERAPEUTICS.

A Case of Antipyrin Eruption.

Webber records (*Lancet*, June 6, 1896) a case of a female patient, aged fifty-three years, who had two months previously undergone supra-vaginal amputation of the cervix uteri for cancer. On December 7, 1895, he found the entire surface of her body covered with a copious eruption exactly resembling in appearance that of a severe case of measles; the face and eyelids were also swollen. The temperature was 101.4° F., and the pulse 102. She had been taking ten-grain powders of antipyrin twice daily for the previous three weeks for the relief of pain extending down the right thigh. These had produced no ill effect, but it appeared that on the evening of December 5th she had eaten some unwholesome food, the result of which no doubt interfered with the proper elimination of the drug. Three grains of calomel and a mixture of ammonium acetate were prescribed, and the next morning the skin was almost free from eruption, the swelling of the face had subsided, and the temperature had fallen to 98°. The antipyrin was omitted and pills containing a quarter of a grain of morphia were substituted. Finding, however, that these did not relieve the pain so well as the antipyrin had done, after a few days the patient recommenced taking the powders. After the second dose swelling and redness of the face came on; and she had to again leave them off. No symptoms of cardiac depression appeared to be produced by the drug in this case.

Fatal Petroleum Poisoning in a Girl Two Years Old.

Dr. Axel Johansen relates (*Norsk Magazin for lævidenskab*, June, 1896) the case of a little girl two years of age who had drank an unknown amount of petroleum from a beer bottle. Taken immediately to the "Rigshospital," she was found to be pale, with cyanosed

lips, embarrassed breathing, drowsy, but not unconscious. There was nothing on the lips or the tongue; the tonsils were slightly swollen. The pulse was 144, slightly irregular; cardiac sounds normal; respiration 56; temperature 37.5° C. The introduction of a finger into the pharynx provoked vomiting of mucus with a little blood, and having an odor of petroleum. The stomach was washed out, and the contents of the intestine removed by help of an injection; they smelled also of petroleum. In spite of stimulant treatment, the child became gradually more drowsy and died at the end of three hours.

At the autopsy, the pleural cavities, which appeared normal otherwise, were found to contain 30 to 40 cc. of a limpid liquid having the odor of petroleum. There was hyperemia of the mucous membrane at the bifurcation of the trachea. By pressure on the lungs a very fluid liquid was squeezed out of the bronchi, smelling markedly of petroleum. The lungs were of the normal size, but rather heavy; in their whole extent they presented a dark reddish-blue color; only the anterior parts were crepitant. The stomach was distended with gas and contained a little petroleum, the mucous membrane was pale, without excoriations or ulcerations. The other organs showed nothing abnormal.

The author takes occasion to discuss the clinical and toxicological properties of petroleum, giving references to several papers connected with the subject.

NEWS AND MISCELLANY.

The regular meeting of the Medical Section of the Buffalo Academy of Medicine was held October 13th. Papers read were: "The Use of the Stomach Tube," Dr. A. L. Benedict; "Acute Plural Effusions in Children," Dr. J. C. Clemensha; "Dangers of Over-Bicycling, with Report of Case," Dr. W. C. Krauss.

At the recent annual meeting of the staff of the State Asylum for Chronic Insane of Pennsylvania, at Wernersville, the following officers were re-elected for the ensuing year: President, Dr. W. Murray Newman, of Reading; Vice-President, Dr. Wm. M. Guilford, of Lebanon; Secretary, Dr. S. S. Hill, of South Mountain. The resignations of Dr. Jas. Tyson and Dr. W. W. Keen were transmitted to the Trustees, which vacancies have been filled by the appointment of Dr. Fred. A. Packard, of Philadelphia, and Dr. John F. Carpenter, of Pottsville.

The ninth annual meeting of the Southern Surgical and Gynecological Association will be held in Nashville, Tenn., November 10th, 11th and 12th. Those who contemplate attending the Pan-American Medical Congress, to be held in the City of Mexico, November 16th to 19th, will have

time to do so after the meeting of the Southern Surgical and Gynecological Association. A rate of one fare for the round trip has been made on account of the Congress, stop-over privileges being allowed holders of tickets therefor.

The following is a partial list of the papers to be read: "President's Address," E. S. Lewis, M.D., New Orleans, La.; "Acute Mania Following Surgical Operations," Joseph Price, M.D., Philadelphia, Pa.; "Treatment of Carcinoma Uteri," Jas. T. Jelks, M.D., Hot Springs, Ark.; "Maternal Impressions and Their Influence upon the Fetus in Utero," illustrated by photographs, C. H. Mastin, M.D., Mobile, Ala.; "Ureteral Anastomosis," J. W. Bovee, M.D., Washington, D. C.; "Splitting the Capsule for Nephralgia, with Report of Cases," George Ben Johnston, M. D., Richmond, Va.; "Vaginal Drainage in Surgery of the Uterus and Other Pelvic Structures," W. H. Wathen, M.D., Louisville, Ky.; "Peculiarities of the Surgical Diseases and Injuries of the Neck," Edmond Souchon, M. D., New Orleans, La.; "The Dry Method in Intra-Uterine Surgery," Edwin Walker, M. D., Evansville, Ind.

The matter of consanguineous marriages is made the subject of an interesting brochure by Dr. Paul Perrin, who discusses the matter from the earliest historical periods and bases deductions thereon from physiological as well as moral points of view. The Persians, Medes, Hindoos, and Ethiopians married with their mothers, daughters, and granddaughters in considerable proportions, and the first-named accorded a special consideration to the children born of marriages between mother and son. Amongst the Greeks, brothers and sisters of the same father but of different mothers could marry. At Athens, the brother, when sole heir, was obliged to marry his sister or to give her a fortune. When the Ptolemys, of Grecian origin, became sovereigns of Egypt, they intermarried in the interest of the dynasty. Cleopatra, who issued from this family, married her two brothers, Ptolemy XII, and Ptolemy XIII. On the other hand, under the Roman empire, alliances between relatives were severely prohibited; thus the marriage between uncle and niece was considered as incest, while marriages between cousins, after having been permitted for some time, was finally forbidden under pain of death. The Arabs married with their mothers until Mahomet, but the Prophet forbade such unnatural unions as well as many others when he came to power. The natives of Peru, Brazil, and California seemed to have paid but little attention to consanguineous alliances, but they were severely punished by the Mexicans. The Chinese Legislation forbids marriage between persons in the remotest degree related, and strange to say, the same law is in force in Turkey, where polygamy reigns supreme. The Roman Catholic Church, too, has shown herself in general

severe against blood marriages. The Council of Tolide, in 531, prohibited them absolutely, but later on other councils showed themselves less rigorous, permitting marriages between first cousins, but as soon as Pope Gregory the Great came to the throne he cancelled that permission. To come down to modern times, consanguineous marriages are not infrequent in France. Statistics show that the annual average of marriages between aunts and nephews is 58, between uncles and nieces, 168, and between first cousins, 2,930. In Great Britain, although both the English and Roman churches forbid such marriages when they are known beforehand, they, nevertheless, are occasionally consummated.

A new medical journal will appear in January, published at Edinburg, Scotland, as a rival to the old *Edinburg Medical Journal*. The latter has lately been sold to a new publisher, and a new editor appointed. The new venture is to be the "property of the profession" and is said to have strong financial and literary support.

Cases of focal and Jacksonian epilepsy upon which he has operated, are reported in the August *Annals of Surgery* by Dr. C. B. Nancrede. The course pursued by these and other cases of epilepsy upon which he has operated, confirm the conclusion to which he has been reluctantly forced that (a) removal of the discharging lesion in cortical and Jacksonian epilepsy can only be regarded as palliative, the operative scar, in all cases thus far accessible to him, becoming in time a new source of irritation. (b) The earlier the operation is done after the disease becomes fully established the longer will the immunity last, and it is possible that if trephining is done very early the operation may in a few instances prove curative, especially if any reliable method can be devised to lessen the extent of the inevitable scar and adhesions between the brain and the membranes. (c) That operation is not so dangerous in competent hands as to forbid our urging trephining in this class of epilepsies, especially when done early, because the chance of prolonged immunity is great, and the fits are apt to be slighter and to recur at greater intervals after relapse than before trephining. (d) Removal of the discharging lesion is imperatively demanded as a life-saving measure in those rare cases where the intervals between the fits are so short that the paroxysms are practically continuous. (e) In all cases, but especially in those characterized by frequent paroxysms, it is an error in practice to permit the early resumption of work, particularly manual labor. Thus, the author calls attention to a case in which he trephined for ordinary traumatic epilepsy, which remained perfectly well for nearly two years, until, attempting to lift a heavy weight, the encephalon becoming suddenly congested, the patient at once had a fit, since when the convulsions have been nearly as frequent as

they were before operation. (f) Operation removes only one of the factors productive of epilepsy, but the ready response to inadequate stimuli still remains, and can only disappear, if ever, after a prolonged period; therefore, careful avoidance of everything which either through the mind or body can excite sudden and severe acute cerebral congestion, or undue prolonged mental strain, constant congestion of the nervous centres, must be avoided for the longest practicable period—for the remainder of life if possible.

Nervous manifestations of diagnostic value in syphilis are enumerated as follows by Dr. J. Allison Hodges, in a paper read recently before the Richmond Academy of Medicine and Surgery:

1. Headaches, which disappear if paralysis occurs.
2. Insomnia, nearly always associated with headache, and disappearing with the appearance of convulsion or paralysis. It differs from the insomnia of neurasthenia and melancholia in that it occurs in the early night, the victim arising in the morning ready for his daily labor.
3. Vertigo, occurring usually with the headache. It may be transient, but becomes worse as the disease progresses.
4. Tremor, present in one-half of the cases. It occurs most often in the order named: In the hands, tongue and over the whole body, and is accompanied by headache. If it occurs in a limb, it is the precursor of paralysis of the limb.
5. Hemiplegia.
6. Erratic distribution of paralysis, as aphasia with or without hemiplegia, ptosis, insanity or epilepsy, with paralysis of one arm or leg. It is suggested that ptosis occurring suddenly points nearly always to syphilis.
7. The use of electricity to determine central or peripheral lesion.
8. The presence of great weakness and mental dullness. This is one of the most valuable of the nervous manifestations, being out of proportion to the seeming condition of the patient.
9. History of the case. In women, the history of many abortions in succession would point to syphilis.

When applied to the skin or a mucous membrane burnt by carbolic acid, according to Prof. Carleton (*La Semaine Medicale*), vinegar causes a quick disappearance of the characteristic whiteness, as well as the anesthesia produced by carbolic acid, and prevents the formation of a slough. It also neutralizes any carbolic acid that may have been introduced into the stomach. In cases of poisoning, then, the first thing to do is to make the patient drink some vinegar mixed with equal parts of water, and to wash out the stomach. According to Billroth, soap is an antidote in carbolic acid poisoning.

In cases of suspected tuberculosis, the fever thermometer approaches most nearly to the zenith of its perfection and utility as a diagnostic instrument, says Dr. C. W. Ingraham in the *Medical Record*. From close observation in a large number of cases, I feel sustained in the assertion that a rise of temperature of from one-half to one degree at some period of greater or less duration every twenty-four hours may be regarded as the first symptom of pulmonary tuberculosis. I believe that this rise of temperature, as a rule, occurs previous to every other symptom, except when tuberculosis follows in the wake of some acute disease without intervening recovery of health. At the very beginning of tubercular involvement, with the formation of the first tubercular nodules, is the most promising period to successfully treat the disease. At this stage, the patient raises no infected sputum, which excludes the use of the microscope. The physician is not justified in deciding positively that a disease is non-tubercular until he has before him a complete record of the patient's temperature, showing no recurring daily elevation, for a period of two weeks. An elevation of one-half a degree, occurring daily at some time in the afternoon or evening, should cause a strong suspicion of tuberculosis. An elevation of one degree during a similar period will justify a positive diagnosis of pulmonary tuberculosis, and this diagnosis will in ninety per cent of cases be confirmed by microscopic examination at a later period. With a fever thermometer and a microscope in our possession, and by intelligent use of the same, we are in a position to render tubercular subjects a most accurate and scientific diagnosis.

The relation that the ovaries bear to the determination of sex has recently been made the subject of a series of observations by Seligson (*American Druggist and Pharmaceutical Record*). His theory is that ova from the right ovary develop into males, those from the left into females. Experimenting upon rabbits, he found that when the right ovary had been removed, only female young were born, while when the left ovary had been extirpated, only male young were brought forth. But he further draws attention to another fact. He states that in all the cases of tubal pregnancy of which he could obtain notes, where the sex of the fetus was given, nineteen in all, those of the right side were without exception males and those of the left females.

It is easier for an American to get the degree of Ph.D. at most of the German universities than it is for him to get it at any one of the dozen or more American universities of the highest grade. In Germany, it is the lowest degree given, hardly more than equivalent, if, indeed, it is equivalent, to our Master of Arts. Yet many among us, who care little for their A. M., would be proud to flourish a Ph.D. from a German institution.—*Medical Times*.

The two-fold spectra exhibited by oxygen and nitrogen have been made the subject of investigation by Mr. Baly (*Medical Record*). The popular persuasion is that all the atoms of a particular element are exactly alike. Gaseous molecules are free to move in any direction, and when gas or vapor is rendered luminous, as by passing an electric spark through it, unlike an incandescent solid or liquid, it does not give a continuous strip of color in the spectroscope, but a number of bright lines at intervals separated by dark gaps. If, while the bright lines are being observed, a beam from an electric light or lime-light is directed toward the spectroscope, they are seen as dark lines upon the ribbon of variegated color, which distinguishes an incandescent solid. The change is supposed to be due to the absorption by the gaseous molecules of light of certain definite wave-lengths. Mr. Baly's observations go to show that the variability in the spectra of oxygen and nitrogen is due to some profound difference of condition in the gas under different circumstances. For the gas that collects about the point whence the sparks leap across the containing vessel, after a little while is slightly dimmer or lighter than at the other. One of two results must follow: Either those gases (oxygen and nitrogen) are not elements, or there are two kinds, one with an atom a little heavier than the other.

That there is no agony in dying is the conclusion of a writer in *Scribner's Magazine*. He says that two ideas are very generally adopted which experience shows to be false. One is that the dying usually fear death; and the other, that the act of dying is accompanied by pain. It is well known to all physicians that when death is near, its terrors do not seem to be felt by the patient. When Nature gives her warning, death appears to be as little feared as sleep. People almost always come to understand that recovery is impossible; it is rarely needful to tell anyone that this is the case. Most sick persons are very, very tired. Sleep—long, quiet sleep—is what they want. I have seen many people die. I have never seen one that seemed to fear death, except when it was or seemed to be rather far away. Even those who are constantly haunted, while strong and well, with a dread of the end of life, forget their fear when that end is at hand. As for the act of dying—the final passage from life to death—it is absolutely without evidence that the oft-repeated assertions of its painfulness are made. Most people are unconscious for some hours before they die; and in the rare cases where consciousness is retained unimpaired until a few minutes before the end, the last sensation must be of perfect calm and rest. (Some have testified that it is exceedingly pleasant). It is worse than cruel to add to the natural dread of death which oppresses the majority of us while in good health, the dread of dying.

A case of congenital occlusion of the urethra is reported in the *Medical Record* by Dr. Theo. G. Davis, of Bridgeton, N. J., in a female child who did not pass water for three days, when his attention was called to it. On examination no urethral orifice or urethra could be found, but upon inserting the little finger into the vagina, about an inch and a fourth, there could be felt a fluctuating body, evidently the distended posterior urethra. With a finger in the vagina as a guide, a small trocar was thrust through the tissues where the urethra should have been and a small catheter was passed through the cannula into the bladder, where it was retained for four days, the urine being passed through it until it was removed and then through the wound made. The girl is now eleven years old and has always had perfect control over urination.

The active infecting principle in pertussis, according to Prof. Kurloff (*Medical Press and Circular*), resides in an ameba or small granular protoplasmic mass with inherent motion and the power of throwing out ameboid projections. After this ameboid body has obtained a definite size, clear refracting nuclei can be observed in its interior, which gradually increase and finally congregate as spores in a concentric sheath. When this envelop bursts, the spores are set free and are easily transported to a suitable medium where they germinate and repeat the same ameboid cycle.

Chlorosis is no contra-indication to marriage, according to Grosset (*Medical News*). He has made an exhaustive research into the subject, and draws these conclusions:

1. The physical and spiritual excitement which marriage offers a chlorotic girl can have only a favorable effect upon her disease.
2. The sterility of chlorosis is only a temporary one in most cases, the rare instances of infantile genitals being excepted.
3. Chlorosis does not predispose to abortion.
4. The children of chlorotic women are likely to be chlorotic, but seem to show little tendency to become tuberculous.

Some of the old-time popular sea-side resorts of Southern New Jersey, which for years have suffered for lack of adequate railroad accommodation, are showing in a notable degree the results of the present improved transportation facilities. Those who "go down to the sea" by rail, now may leave Philadelphia and reach Sea Isle City within seventy minutes, or Cape May within 100 minutes. This great improvement is the result of the excellent facilities and superior service afforded by the South Jersey Railroad. Express trains leave Chestnut Street and South Street wharves for Sea Isle City 9.15 A.M., 4.15 P.M., and 5.15 P.M.; for Cape May 9.15 A.M., 2.15 P.M., 4.15 P.M., and 5.15 P.M. In addition there is on Saturdays the 1.00 P.M. "Flyer," for both Sea Isle City and Cape May.